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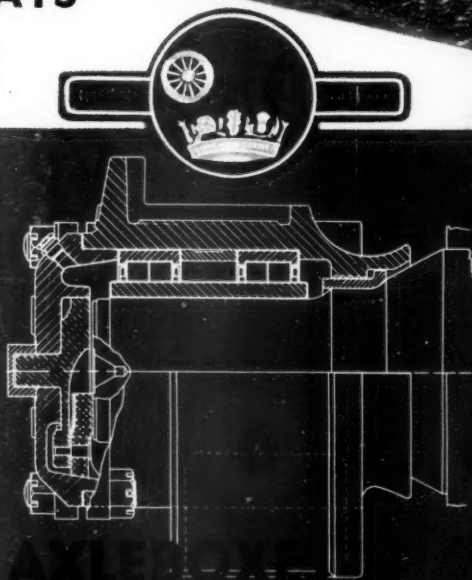
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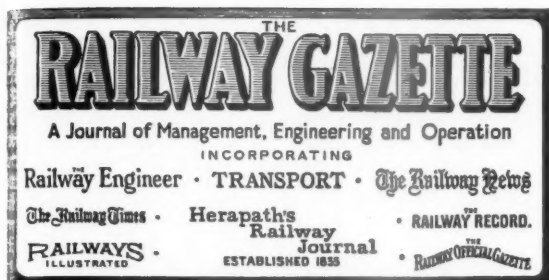
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No Wage Stability

IT is clear that hopes of wage stability on British Railways, raised by the agreement of the National Union of Railwaymen last March to "give formal and sympathetic consideration" to the principle of periodic reviews of railway wages at agreed intervals of time, have been raised too high. It was known during the Southport conference of the N.U.R. last month that the union, in common with others, would press for a 40-hr. week in the near future, but it is now known definitely that a resolution in respect of a wage claim was passed at that conference. The executive committee of the N.U.R. has now handed its instructions to the negotiating committee, charged with presenting the claim to the British Transport Commission. The amount of the claim and its timing were left by the resolution to the union executive, so that, by the time the negotiating committee has considered these matters and reported back to the executive committee, at least a month is likely to have passed. Only then will a formal claim be submitted, possibly simultaneously with that for a 40-hr. week. If the N.U.R. submits its claim, it is unlikely that the Associated Society of Locomotive

Engineers & Firemen—which has not agreed even to consideration of periodic wage reviews—and the Transport Salaried Staffs' Association, which has given a similar undertaking to that of the N.U.R., would stand by without submitting claims of their own, particularly as strenuous efforts have been made recently—at least by the N.U.R.—to bring the policies of the three unions together. It may well be that railway fare increases will be imposed next month to pay for the higher railway wages granted last March, those which, the Commission hoped, might herald a period without wage claims. As it is, the Commission may find itself passing on to the public the last pay claim but one. Another series of claims which would affect British Railways is likely to arise from the resolutions passed at Hastings last week by the annual meeting of the Confederation of Shipbuilding & Engineering Unions. The claims are for a 40-hr. week, a third week's holiday, and minimum holiday pay of £2 10s. a day. The total cost of these claims, if granted, might be as much as £150,000,000 a year.

South African Order for English Electric

ANOTHER large order for electric locomotives has been placed in Britain by South African Railways, bringing recent contracts for the "5E" class to a value of some £16,500,000. The latest order has been placed with the English Electric Co. Ltd. and is for 55 of these 2,000-h.p., 3,000-V. d.c. Bo-Bo locomotives, of which English Electric has already built, or is building, 105 ordered since 1952. As recorded in our July 19 issue, Metropolitan-Vickers has orders for 135 similar locomotives, the electrical equipment for which is being made at the Sheffield and Trafford Park Works of Metropolitan-Vickers and the mechanical parts at the Stockton works of Metropolitan-Vickers—Beyer, Peacock Limited, where the locomotives are being erected. The first of the "5E" locomotives was delivered by English Electric in the autumn of 1955 and was intended to replace earlier 1,200-h.p. locomotives on the Volksrust-Durban line of South African Railways and on the electrified Ladysmith-Harrismith section. The large numbers ordered since that date, intended for general working over the rapidly widening electrified network, suggest that this design has proved eminently satisfactory in South African conditions.

Record Machine Tool Production

MACHINE tool production in the United Kingdom is now at the rate of £98,000,000 a year, a record level which is enabling the industry to reduce the length of time between order and delivery by substantial amounts. The order book at the end of May stood at £91,470,000, so that the backlog of orders has been reduced to less than a year's work. Export orders have continued, on average, to increase and for the first five months of the year they amounted to £11,370,000, against £9,230,000 for the similar period of 1956. Home orders have presented a less satisfactory picture, new orders up to May having fallen from £30,960,000 last year to £23,990,000. Since May, however, it is reported that home orders have been rising and there has been a significant increase in the number of enquiries. This is probably the result, at least in part, of the shortened delivery times which can be offered and rises in the prices quoted by foreign competitors, a combination of factors which encourages buyers to look to home industry for their needs. Home orders for May, in fact, rose to £4,820,000 compared with £4,200,000 for April but were still well below the monthly average of £5,320,000 for last year and the figure of £5,480,000 for May, 1956.

More Steel for Railways

DIRECT deliveries of steel to railways and other important consuming industries—shipbuilding, mining, building, and constructional engineering—were almost 7 per cent higher in the first half of 1957 than in

the corresponding months of 1956. This increase was to some extent at the expense of other industries, particularly the motorcar industry, but total deliveries of finished steel products improved by 2.7 per cent on the previous year. An indication of the growing activity on British Railways and among railway equipment manufacturers is that in the first quarter of 1957 they took 320,700 tons of finished steel compared with 298,600 tons in the first three months of 1956, an increase of 7.4 per cent. In the second quarter, provisional figures issued by the Iron & Steel Board show an even greater increase, from 282,800 tons in 1956 to 313,800 tons this year, or 11 per cent. Deliveries of heavy rails, sleepers, and fishplates rose by 10.5 per cent in the first quarter and by 18.6 per cent in the second, when 187,000 tons were delivered this year compared with 157,700 tons in 1956. Deliveries of plate, to all customers, improved by 6.5 per cent in the first quarter and 9.3 per cent in the second.

Heartening Prospect

THE need for a determined effort on the part of all railwaymen towards overcoming the working deficits of British Railways during the next few years, until the time when modernisation and other measures begin to result in increased earnings, is emphasised by "The Man on the Line" in the August issue of *British Railways Magazine*. The loans from the Government to the railways to tide over this period must, he rightly points out, be made good in the end. Nevertheless, he considers the statement in the British Transport Commission annual report for 1956 that "the Commission believe that their trading position in the next few years should steadily improve" to be heartening, and to mean that 1957 may well mark the "turn of the tide." His contention that 1956—a year of solid progress, particularly with modernisation—was the most exciting of the years since nationalisation will be echoed by many, for in that year the plans for British Railways began to be translated into fact. The railways and their suppliers have shown that they can exceed expectations with some of the work of modernisation—notably electrification and the fitting of wagons with continuous brakes, both of which programmes are ahead of schedule; and on the commercial side the maximum charges scheme, permitting competitive charging, is now in operation.

Preventing Fires from Engine Sparks

WITH steam the predominant form of motive power on railways in many countries with spells of hot weather and a general lack of water, the measures taken by the South African Railways to prevent fires on property adjoining the line, are of wide application. They include tree planting alongside the track to act as windbreaks for preventing sparks from engines being blown across fire paths, fitting of spark arrestors to steam locomotives, and creation of fire paths. Tree planting along the track in rural areas was started more than 50 years ago, but has been greatly accelerated recently so as to minimise the danger of fires. More than 1,000,000 trees have been planted in many parts of the Union since the inception of the scheme, which has been specially effective in the Natal canefields. The line from Durban to Northern Zululand is bordered by three rows of trees over 300 miles. Tree planting on a big scale was started recently between Sir Lowry's Pass and Steenbras in the Cape; although the trees in this area are still young they are already proving their worth. It is intended to extend the scheme to all parts of the Union, but work is being hampered by a shortage of water in some areas.

Serving Southend Airport

THE incident last week in which an aircraft skidded off the runway at Southend Airport and finished up with its nose over the Liverpool Street-Southend electrified line emphasises the closeness of the railway to the airport

and the ease with which it could be rail-served. Southend is now being spoken of as the third of the airports which may eventually be required to serve London, and the report of the Millbourn Committee, referred to in these columns last week, that London Airport will be working to even its increased capacity within a few years, suggests that the day when Southend will be needed is not far distant. Southend Corporation began the operation of its airport in 1947, when there were 401 commercial flights. In 1956 there were 15,887 commercial aircraft movements involving 86,286 passengers and 12,722 tons of freight, and these figures may well be doubled this year. London Airport now seems likely to have an efficient and remunerative railway service in the near future, and Gatwick, the alternative airport, already has its rail connection. An airport railway station at Southend, which concentrates at present on flights to and from the Continent, could provide a good, fast electric service to Liverpool Street at little additional cost to British Railways, and no doubt it is already being considered.

Seat Reservations

LITTLE more remains to be said on the subject of seat reservations on British Railways. The charge is unproven—and it is very doubtful whether it had any basis in fact except in an insignificant minority of cases—that false reservation labels are affixed by the staff for the sake of the tips from passengers who are placed, apparently officially, in what seem reserved seats after seeking in vain for unreserved places. Suspicion in some cases may result from the cause of the second problem—that of the anti-social intending traveller who reserves more than one seat for himself at 1s. each in two or more trains, to ensure a seat when he does travel. The solution may well be to demand a deposit of, say, 10s. on making a reservation as is the practice in issuing sailing tickets on the Anglo-Irish services. Seat reservation has now become an "essential amenity" of travel—though it has its uses in giving some prior indication of the passenger complement. Given the numbers of trains it is now possible to reserve in, and the great density of travel, the high average level of service given reflects well on the railways. A reserved seat at 1s. is one of the few things which have not risen in price since 1939. As to the varying number—six or eight—of seats in a second class side-corridor compartment, the indications seem to be that six eventually will be the number in trains in which seats are reservable.

Developing the Railways of Tanganyika

THERE are at present in Tanganyika three separate lines of East African Railways & Harbours: the Tanga Line in the north, which connects physically with the E.A.R. Kenya line; the Central Line westward from Dar-es-Salaam; and the Southern Province Railway. The importance to the territory of railway development is stressed in an article by Mr. O. P. Blake, Editor of the *Tanganyika Standard*, in the August issue of *East African Railways & Harbours Magazine*. He considers it essential that major projects such as sugar growing in the Kilombero Valley and the exploitation of coal in the Songea district should be served by rail. A link with the Rhodesias is badly needed; but East African Railways have already taken such steps as are possible. A survey for a 72-mile railway from Kilosa on the Central line to Msolwa in the Kilombero Valley was undertaken as long ago as 1955. A line starting from Korogwe on the Tanga line, crossing the Central line in the neighbourhood of Kidete and continuing in a south-westerly direction via Iringa, Mbeya, and Serenje to Broken Hill in Northern Rhodesia has long been projected. A branch—also planned some time ago—leaving this line some 60 miles from Mbeya and running south-east and then east would serve Songea on its way to join the Southern Province line at Nachingwea. Building of these lines, however, depends, as does other development in Tanganyika, on attracting sufficient capital.

Modified "West Country" Class Locomotive

THE "West Country" class locomotives, introduced in 1945 by the Southern Railway, were a lightweight version of the "Merchant Navy" class Pacifics designed during the war by Mr. O. V. S. Bulleid, then Chief Mechanical Engineer of the railway. Between 1945 and 1951, 110 of these locomotives were built, 104 at Brighton and six at Eastleigh. Some of these locomotives are being modified on similar lines to the work carried out on the "Merchant Navy" class, described in our issue of April 27, 1956. The first modified locomotive, No. 34005 *Barnstaple*, has now been completed at Eastleigh. The three-cylinder arrangement has been retained, using the two existing outside cylinders but with a new inside cylinder. The oil bath enclosing the special valve gear and inside motion, which was found to cause excessive use of oil and also, because of the entry of water, corrosion of the motion details, has been dispensed with. As with the "Merchant Navy" class, three independent sets of Walschaerts valve gear are now provided, the inside gear being driven by an eccentric mounted on the right-hand crank web of the driving axle. The irregularly-shaped smokebox has been replaced by a cylindrical smokebox, and the special boiler casing has been removed.

Misunderstanding on the Telephone

THE initial cause of the collision outside London Bridge station on October 22, 1956, was, as will be seen from our summary in this issue of Brigadier C. A. Langley's report, insufficient care in giving a telephone message authorising a train to leave under hand signal, necessitated by a track circuit failure. The signalman did not make sure to whom he was speaking and that what he told that person was perfectly understood. That man took the message to refer to another train and, not being trained in hand signalling, passed it to a foreman who, without further question or precaution, authorised this wrong train to depart. The points were so standing as to lead it to a facing line along which an incoming train had been correctly signalled, but both motormen were alert and braked as promptly as possible. The resultant collision was not very serious in consequence. Rules regarding the securing of points had not been complied with by men well aware of their prescriptions and an instruction covering the starting of trains overlapping the platform signals had been interpreted and applied to these cases of actual electrical failure. Brigadier Langley thinks that, with modern controls and point machine locking, instructions might now be reframed so as to avoid, when it can be done with safety, following a procedure often necessarily productive of much delay and offering a proportionately strong temptation to ignore it.

Air for Electric Locomotives

A FEATURE of electric locomotives which is not always appreciated is the large air requirement, as large as that of a steam locomotive of equivalent power, particularly when force-ventilated traction motors are installed. Much of the electrical equipment over which or into which the air passes is sensitive to dust, and efficient filtration is needed. Many electrified railways are in mountain or country districts where contaminated air is not a problem, though in a few cases track dust may be. In industrial areas air filtration may be of more importance; and within recent months tests with a variety of filters have been made on four Bo-Bo locomotives on the Manchester-Sheffield line, where there are industrial areas at each end and cleaner air over the moors in the centre. These units draw in 10,800 cu. ft. of air per min. through 18 panel filters. Five types of panels were tried: one dry impingement, two oil-wetted impingement, one oil-wetted Neoprene bonded hair, and one herringbone wire mesh. The Vokes three-ply oil-wetted type seemed to be superior to the others, and with a face velocity of 300 ft. per min. there was neither fall-off in efficiency nor premature choking over periods of 60 days.

Problems of Passenger Services

THE brief preliminary announcement by the British Transport Commission of the more notable features of British Railways winter passenger services, mentioned on another page, indicate some remarkable and, from the details given, commendable recasting of schedules on the East Coast route to Scotland. Electrification is in progress on the East Coast main line of the Eastern, and on the Crewe-Manchester line of the London Midland Region. It has already precluded accelerations that might otherwise have taken place over these sections and has adversely affected punctuality on the East Coast route. No doubt the new timetables will include measures to deal with these difficulties.

The London Midland Region has set a good example this summer by recasting its Midland Division timetable. It will be some time before enough diesel power is available for diesel working of complete services of expresses over any one route; but the necessity for the railways to improve what they offer to the travelling public surely justifies far-reaching alterations in services—and as soon as possible. We have advocated, and continue to advocate, the principle of "shorter trains and more of them." There are signs that several Regions are working towards not only more frequent long-distance trains, but also towards more even spacing out, with regular interval departures where possible. As to loads, any step which tends to punctuality—in so far as load is a factor—is to be welcomed. For the duration of the winter services, except at weekends, a good many expresses, we believe, might with advantage be shortened, and without loss of revenue from fares on the one hand, or overcrowding on the other. The problem of unpunctuality was dealt with by Mr. G. F. Fiennes, Traffic Manager (Great Northern), Eastern Region, in his article in the *Transport Review* discussed in our July 5 issue. Apart from doing everything possible to inculcate the right attitude, on the part of the staff, to punctuality, and to improve locomotive maintenance and coal supplies, there seems little that can be done except make allowances in the timetables for permanent way restrictions—a practice which, as Mr. Fiennes shows, is open to serious objections. Punctuality bonuses for drivers, as in France, would probably be of great assistance. It seems clear that the human element is the principal factor, so that the matter is largely one for junior officers and supervisors. It is for speculation how far many railwaymen who could not be accused, in general, of an irresponsible attitude towards their work, realise the very great loss of goodwill to the railways occasioned by unpunctuality of trains. Explanations to the public, of late arrivals, might also be more plentiful.

The case for recasting timetables does not rest only on frequency and speed of main-line trains, particularly from and to London and the larger provincial cities. With the tendency for industry to establish plants in smaller towns, or in the country, the railways must make efforts to give the smaller places a good service, if possible as quick as possible to and from major centres. It is in serving the smaller places, which are unlikely in the foreseeable future to be served by air, that the railways can gain passenger revenue. There are three ways of doing this. The first is to stop expresses at the smaller place, if it is on the main line, or, if it is not, at a convenient "railhead" station (such as Doncaster, to serve Scunthorpe), whence the journey can be made by motorcar. The second is to serve the smaller place by fast railcar from a major junction. The third method is to run through coaches. The advantage of a frequent service of main-line expresses is that some of them can be stopped at junctions and other stations without lessening the number of non-stop runs between major centres. Through coaches in general tend to waste time, and make for unpunctuality. In this age of travelling light, their day seems past—except where local sentiment is powerful. The ideal solution seems to be a frequent service of expresses on regular interval timings, with stops at fairly frequent intervals to serve smaller places both on the route, and connected by railcar, or by

road; and this service should be supplemented by high-speed trains with very few stops. It may be that parcels traffic justifies its existence in many cases, but much more ruthlessness might well be shown in abolishing the slow main-line train where it can cause unpunctuality; as a means of carrying passengers, it seems to have been long obsolete on most routes.

Indian and Pakistan Railways Since Partition

THE ten years since the partition of India in August, 1947, with the consequent division of its railway system between the two dominions of India and Pakistan, and the retirement of many senior British railway officers, have not seen anything to justify the worst fears entertained by many people at the time. These fears were based largely on the fact that partition involved disruption of the railway system of India, which up to 1947 was functioning as an integrated whole under the guidance of the Railway Board, and with co-operation between individual railways—some of which had been company-owned and company-operated until a relatively short time before partition—under the aegis of the Indian Railway Conference Association. The evils of division of the system between two countries, one of which, Pakistan, was in two entirely detached parts, were made worse by the fact that both dominions were left with portions of railways which had been divided by the new boundaries. The war had placed a great strain on the railways throughout India, more particularly on those in the eastern and north eastern parts of the country.

Nevertheless the railway systems handed over at partition to the two new states could not be called "a worthless bag of assets." Under British control they had been well built and for several decades supplied from Britain with equipment of high quality. The standard of maintenance had long been high—and only the arrears inevitable in wartime marred what had always been a remarkable record. Operating efficiency had been, and remained, at a high level. The standards of safety and signalling generally would have been notable on any railway system with so high a proportion of single line. Above all, the railways inherited by India and Pakistan took over, in 1947, not only a staff of many thousands in the wages grades well trained in their jobs, and inheritors of a long tradition of skill and sense of duty, but also a corps of trained Indian officers to take over from the British officers leaving India. There was a comprehensive series of staff welfare services, varying from railway to railway—for which the British managements must be given credit.

The new State of India was left with the less truncated railway system. Since partition there was, first, prompt action to reorganise and adjust the railways to the new boundaries and the new traffic flows, and, second, a vigorous policy of adapting and expanding the railways to meet the demands placed on them by rapid industrialisation and economic growth, exemplified in the second Five-Year Plan. The reorganisation of the railways has taken comparatively little time, in view of the complexity of the task. After a short interim period during which the N.W.R. lines east of the Pakistan frontier formed the East Punjab Railway, all the railways in the Republic were re-grouped in the six systems: Central, Eastern, Northern, North Eastern, Southern, and Western. With, latterly, the formation out of the Eastern of the South Eastern Railway—virtually the former Bengal Nagpur. Whether the present seven railways will survive in their present form is problematical. Several include both broad and metre gauge, with narrow gauge in addition in some cases. On the other hand, the organisation now seems reasonably well adapted to traffic flows. Care was taken to ensure that each of the seven railways had at least the nucleus of adequate repair shops, stores, and operating headquarters. One of the first steps taken by India to readjust her communications after partition was the construction in a short time of the Assam Link line, avoiding Pakistan territory, and affording a partly

metre-gauge route between Northern Assam and the rest of the Republic. More recently, there has been co-operation between the two countries in the loan of rolling stock.

The establishment, with the co-operation of the British locomotive industry, of the locomotive works at Chittaranjan was one of the first measures taken by the Indian Railway Board to increase motive power; a start was made on levelling the site in March, 1948, and despite severe shortages of materials the first locomotive was completed by November, 1950, whilst the output recently was 14 main-line broad-gauge engines a month—a very considerable feat in the circumstances. Motive power policy in the earlier days was, rightly, to adhere to steam, to which the staff have long been accustomed. Gradually, however, the Railway Board has come to favour diesel operation on several main lines. This policy was adopted after study of diesel working of branch lines in waterless country, notably the new Kandla-Deesa branch of the Western Railway. When the main lines on which diesel units are to work are electrified, the diesels will be transferred elsewhere. Electrification at 3,000 V. d.c. is in progress, and the industrial frequency a.c. system is being considered for main line conversion.

In view of uncertainty as to oil supplies, steam is likely to be the principal motive power for some years. A good deal of research is being directed to improvements of the steam locomotive. Much has been done to increase the comfort—rather than the speed—of passenger trains. Air conditioning has been extended. Third class stock has been equipped with amenities such as fans, and third class reclining chair cars and sleeping cars introduced. A major development is the Integral Coach Factory at Perambur, near Madras.

There has been, and there is still in progress, much new line construction. The most notable projects perhaps are the South Eastern Railway new lines in connection with the expansion of the steel industry. Various surveys have been made. In general, new construction is now a matter of financial sanction.

Operating efficiency, which is already at a high level, is being increased by new marshalling yards, such as that at Moghal Sarai; in view, presumably, of the labour position, these yards do not appear from accounts to be as highly mechanised as new yards in other countries. Research is being pursued actively in the well-equipped installation at Lucknow and elsewhere. Staff welfare measures continue with an increase in the educational facilities for railwaymen—notably in eradicating illiteracy.

Pakistan suffered more than India in the disruption of the railway system in 1947. The lines in Eastern Bengal, and their connections for freight and passenger traffic with the ramified waterways in that province, were particularly badly affected. Active steps have been taken to readjust rail and water services.

Adoption of diesel traction at an early stage after partition and on an extensive scale on the N.W.R., and later, and to a lesser extent, on the E.B.R., is the most important development in Pakistan, where much has been done to ensure efficient servicing of and repairs to diesel locomotives. Diesel power has also been extended to the river craft operated by the E.B.R. In civil engineering, apart from branch-line construction, a great deal has been done to rehabilitate track and bridges, and to conduct research into track problems. Signalling is being modernised. In improvement in operating efficiency, increase in the comfort of passenger travel, staff welfare (which includes T.B. sanatoria for railwaymen and their families on both the railways) the Pakistan managements have shown themselves as active as the Indian and, except in the matter of electrification, followed, broadly speaking, the same principles.

Whilst partition remains an obstacle to efficient railway working, the outlook for the railways in both countries is bright, provided that sufficient funds can be made available for essential replacements and development. Britain will continue to make available not only railway material, but the knowledge of conditions in both countries, based on past experience, and skill in new techniques.

Motive Power in China

THE Chinese Minister of Railways recently announced that certain railways in China are to be electrified. These are three in number: the line running north-west from Peking parallel to the Mongolian border, to Tatung and Paotow (575 miles); secondly, a line starting at Tatung and running south through Shansi Province for about 500 miles to the valley of the Yellow River; and thirdly, on the newly built railway from Paotow to Chengtu in Szechuan, a distance of about 350 miles. All of these lines run in hilly country and certain sections are particularly difficult, with heavy grades and many tunnels, two of them of spiral form. It may be presumed that it is these mountain sections which will first be electrified.

Hydro-electric power stations exist, or are under construction, in the neighbourhood of each of these sections, and there are thus good reasons to anticipate that electrification will be economic as well as efficient. The system of electrification preferred is the 50-cycle 25,000-V. a.c., and all tunnels and bridges have been given adequate clearance with this end in view.

With the exception of these three railways, trunk lines in China are, and will continue to be, steam operated until the country is self-supporting in diesel fuel in sufficient quantity, which is unlikely to be for some years to come. The great majority of the steam locomotives now running consist of standard Chinese-built 4-6-2 and 2-8-2 types, powerful enough to handle passenger trains of 500 tons and freight trains of 3,000 tons. A new type of 2-10-2 freight locomotive of 63,000 lb. tractive effort is running trials, and the intention is to follow this with a 4-8-4 design for passenger work. This last will be a more powerful version of the 4-8-4s now successfully running the heaviest passenger trains (800 tons), and built in 1935 by the Vulcan Foundry Limited. The new locomotives however, will have a 20-ton axleload, as have the 2-10-2s, instead of the previous maximum of 17 tons. In view of the future development of oil production in China, the Ministry of Railways intends to test various types and sizes of diesel locomotive so as to decide what range is best suited to Chinese conditions.

Returning visitors from China have frequently commented on the excellent conditions of the locomotive stock, saying that it is maintained as well as, if not better than, that of other countries. The reason for this may well be the system which has been adopted. Pooling of locomotives has now been abolished. A group of nine men, three train crews of three men each, is permanently allocated to each locomotive under control of the senior driver. These men not only drive the locomotive, but clean, adjust, and maintain it, packing cylinder glands, grinding in boiler cocks, and helping with light repairs. They thus take a personal interest in their own locomotive and for their own sakes, wish to keep it in good running repair. The system has much to commend it in countries which are willing and able to try new methods.

Swiss Federal Railways in 1956

IMPROVED economic conditions in Switzerland in 1956 resulted in increased traffic over the Federal lines. Passenger traffic was 2 per cent and freight 7.8 per cent greater than in 1955, creating a record for the latter, while the former came close to that carried in the exceptional year 1947 and passenger-km. were higher than usual. Passenger receipts rose by 3.7 per cent to fr. 326,625,322 and freight by 6.4 per cent to fr. 486,363,375, which, with certain other income from operating sources, yielding something over 72½ millions, gave a total of fr. 885,544,949. Against this had to be set an increased operating charge of fr. 648,102,813, leaving a surplus of fr. 237,442,136 carried to profit and loss account, the credit side of which showed a total of fr. 264,939,085. Depreciation, capital and loan charges, new pension fund allocations—necessary to meet the altered situation created by salary and

wage increases—and provision for improved equipment for dealing with road-rail traffic and other items gave a total debit figure of fr. 239,675,020, leaving a surplus of fr. 25,264,064. After meeting statutory reserve fund and interest charges a final balance remained at the disposal of the Federal Assembly of fr. 1,264,064.

During the year the railways were granted by the legislature, without demand for a referendum, considerably widened borrowing powers, operative from April 15, 1957, which will enable them to raise at fixed interest rates the capital needed for certain essential modernisation plans, including the long-overdue rebuilding of the main stations at Basle, Zürich, and Berne, so permitting any ordinary surplus to be used more advantageously. After lengthy discussions, ending in a lively political controversy, the citizens of Berne voted in July, 1956, by a two-thirds majority, for rebuilding the main passenger station on the present site, to plans agreed by the city, cantonal and railway authorities, and later granted a contribution of fr. 22,500,000 to the costs, some 9½ millions of that going to constructing an underground station for the Berne-Zollikofen-Solothurn line, at present terminating outside the Federal station.

The main increase in passenger traffic occurred in international services, while freight returns were much influenced by climatic conditions, at home and abroad. The harvest was below normal and cereals had to be imported, while cold weather in Italy adversely affected perishable traffic. Internal freight business was good, however, including special forms, such as pulverised cement in bulk, the demand for which is growing continually, and wagons had to be hired from foreign managements. It is becoming less easy to obtain staff than formerly but every endeavour is being made to render the railway service attractive, not only as regards remuneration, and foster that spirit of pride in it long so distinctive of the undertaking. Improved equipment, such as mechanical handling devices and ticket printing machines, is being introduced to the best advantage, and card perforators are being applied to the handling of accounting and statistical operations. New designs of lightweight passenger stock were constructed, after competitions organised with manufacturers, and met with a very favourable reception. The vehicles used for transporting motorcars through the long tunnels also were further improved to meet a steadily growing demand, while a special heavy-duty twin-unit multi-wheel vehicle for conveying exceptional loads was constructed and put into service early in 1957.

No additional internal route was electrified during 1956, but certain frontier connecting lines, such as that joining the Swiss and German stations in Basle, and leading from Geneva, Vallorbe and Les Verrières to France, were equipped. The supply of electric power, for which additional generating facilities are under construction, as at Göschenen, was affected by climatic conditions, the rains not having been sufficiently heavy to give the desired water storage, while lack of electric locomotives made it necessary to resort to steam haulage at times over electrified routes. The value of the electric energy consumed, itself 2.5 per cent greater than in 1955, was calculated at about fr. 35,000,000 at the sub-stations. Under steam working, 1,700,000 tonnes of coal would have been needed, costing fr. 180,000,000 at the frontier. A certain amount of power is taken from private undertakings in which the Federal management participates financially and these had a satisfactory year in 1956, as did others connected with the conveyance of freight in cold storage.

Good progress also was made with the installation of electric power signalling and the replacement of mechanical by colour-light signals. Over half of the running signals on the system now are of the latter type. A traffic control system was introduced on the Gotthard route, to improve operating efficiency and utilise train crews to maximum advantage, with very satisfactory results.

All these and many other steps taken during the 12 months are described in the annual report, which is more than usually well produced and contains many excellent and informative illustrations.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Track Loading Fundamentals

August 13

SIR,—I refer to the letter dated August 2 from Mr. C. W. Clarke, published in your issue of August 9. I certainly owe Mr. Clarke an apology for misreading one sentence of paragraph 2 of his article No. 6 (your March 22 issue) on the matter of unit loadings used in the design of American railway bridges. The rest of my statement on this matter, however, requires no modification.

In the second paragraph of his letter of August 2, Mr. Clarke questions the first paragraph of the section headed "Stresses in Rails" of my letter of July 3, published in your July 12 issue. What I imply in this statement is that the "body" stresses in shear or bending in rail are not influenced, to any appreciable degree at least, by wheel diameter, whereas the stresses in the rail contact zone with the wheel are a function of wheel diameter and rail head radius as well as of axleload. Body bending stresses in a rail are obviously affected by modifications of the bending moment due to the effects of axles adjoining that under which the effects are being studied.

I am puzzled by the last paragraph of Mr. Clarke's letter of August 2, as I felt that my letter of July 3 should have made this matter quite clear. We feel that the methods of arriving at the combined depth of ballast and granular roadbed as defined in I.C.E. Railway Paper No. 37, to which reference is made, is a rational method of determining this depth. Track ballast as commonly known is merely one component of the granular blanket required to spread the load adequately on the formation.

Yours faithfully,

A. H. TOMS

Research Assistant to Chief Civil Engineer

British Railways, Southern Region,
Waterloo Station, S.E.1

British Railways Rolling Stock

August 13

SIR,—There has been a considerable amount of correspondence in your columns recently concerning the riding of multiple-unit trains. I have just had the pleasure of travelling in the French autorail train between Boulogne and Paris. It was only a single unit, consisting of an 800-h.p. diesel-mechanical motor coach and one trailer; but the riding even in the motor coach was vastly superior to anything I have experienced in this country, in multiple-unit or locomotive-hauled trains.

The soundproofing was so good that in the trailer coach there was no evidence of the diesel engine; the rail joint rhythm was only just perceptible and trains passing on the adjacent track could be seen but not heard. The only noise in the motor coach was the subdued humming of the engine, which was by no means unpleasant. From the platform, the engine when revved gave a muffled roar like that of a high-powered car, in contrast to the tractor-like racket of the Hastings diesels. I recall that another correspondent, who recently drew attention to the smooth and silent Continental diesel trains in contrast to those of the Hastings line, was given the reply that the latter were designed for a difficult line with more gradients and curves than are encountered by the former and must therefore be more powerful. Each Hastings motor coach is only 500 h.p. against the 800 h.p. of the French ones.

As for external appearance, British and French diesels side by side would look as ridiculous as a prewar Austin Seven beside the latest Jaguar. The official excuse that, in view of the urgency of providing an improved service to Hastings, there was no time to develop anything better, would be quite acceptable if they were of a temporary

nature. But it is deplorable that they must blemish the countryside between London and Hastings for another 15 years or so.

The fact that the British loading gauge imposes a restriction from the maximum width of 9 ft. to 8 ft. below platform level has discouraged the introduction of lightweight rolling stock with low centre of gravity, as in other countries. On the Hastings line this does not apply, because maximum width is restricted to 8 ft. above, as well as below, platform level.

It is hard to understand why British Railways use up their most decrepit rolling stock on boat trains. The so-called first class accommodation provided for autorail passengers on this side of the Channel creates a very unfavourable contrast, and must make a bad impression on people entering this country for the first time. The autorail services to both Paris and Basle would be doubly attractive if they connected with a diesel train with similar facilities at Folkestone. What about a three- or four-car version of the six- and eight-car diesel Pullmans now being made for the London Midland and Western Regions, with one 1,000-h.p. power car? The timetable shows that it would be possible to operate a shuttle service with one unit for both the Paris and Basle connections, allowing adequate turnaround time at Victoria and Folkestone. Except for a special driving trailer, the cars would be interchangeable with those of other Regions when being repaired.

I look forward to the appearance of the first diesel Pullman next year, and to travelling in one. I hope I shall not be disappointed.

Yours faithfully,

A. G. M. PRITCHETT

Hill Top House, Park Road, Hale, Cheshire

Improving Passenger Services

August 10

SIR,—I was pleased to see in your issue of August 9 that Mr. B. D. J. Walsh drew a comparison, in his letter, between the current Anglo-Scottish services and those of 1897. Whilst British Railways quite rightly emphasise their forward-looking policy, would not a little retrospect be a good thing when framing, and especially announcing, passenger service "improvements"?

When an announcement of an acceleration over the previous timetable of 8 min. is made, travellers are misled into thinking that some really great improvement has been made. In fact, it may well be the journey is still slower than it was 70 or even 80 years ago. Except for the extra high-speed trains, a journey between many pairs of towns now takes as long as, or longer than, it did 60 years ago, as for example, between many towns in the Midlands, with the same stops; in several instances too there was a greater frequency and better spacing of services, taking into account the change in travel habits which should be reflected in the timetables.

It was irritating to read of the éclat with which the diesel services between Birmingham and Sutton Coldfield were introduced in 1956. A local railway officer with whom I travelled a few days after the event was amazed when I told him that the L.N.W.R. steam service in July, 1914, was not only faster but more frequent. On longer routes, one need only point to the Euston and Birmingham service. When the first 2-hr. trains were put on in 1905, there were four down and three up trips on this timing. Today, five trains each way take the same time, Mondays to Fridays, and there are none on Saturdays. Verp sap.

Yours faithfully,

C. R. CLINKER

9, Regent Place, Rugby

THE SCRAP HEAP

Bouquet

I have just had experience of a British Railways service which is unsurpassed for comfort and convenience—the car sleeper service from Kings Cross to Perth. The accommodation was most comfortable, the meals were excellent—and we arrived in Perth only 10 minutes behind schedule. There are many complaints of overcrowding, late running and poor food, so I am very pleased to be able to hand out a bouquet instead of a brickbat.—*From a letter to "The Evening News."*

Director's Silver Pass for York Museum

Through the generosity of Mr. Clive Cookson, Chairman of the Consett Iron Co. Ltd., a silver medal, or Director's pass, of the Newcastle & Carlisle Railway Company, has been added to the collection of relics in the Railway Museum at York. Mr. Cookson is the grandson of William Isaac Cookson, a silversmith of Newcastle, who was an original shareholder of the Newcastle & Carlisle Railway Company, and a Director from 1846. At a general meeting of the shareholders of that company on March 24, 1840, it was decided to present a suitably inscribed silver medal to each of the directors, as a travel pass.

The medal is rather larger than the former crown, or five shilling piece. It is engraved on one side with the coat of arms of the Newcastle & Carlisle Railway Company and also with the holder's name. On the other side appears an impression of a railway link across the River Tyne between Gateshead and Newcastle (at that time no more than a project). This is surmounted by the figure of Mercury and the inscription *Planum per ardua duco*.

The Newcastle & Carlisle was one of the first railways to link the East and West Coasts; it obtained its Parliamentary sanction as early as 1829 and was opened throughout in 1838. It became part of the North Eastern in 1862.

Logic

A young Frenchman in London for the first time was returning by tube from the West End. He put his money down and in his best English accent said: "For Southgate." He was given four tickets, but thought it was just another strange English custom. At Southgate explanations and a refund for three fares took place. The next time he travelled he said: "To Southgate." He received two tickets.—*"Peterborough" in "The Daily Telegraph."*

Gotthard Railway Jubilee

(See our May 31 issue)

A leaflet distributed by the Swiss Federal Railways to passengers travelling over the Gotthard Line explains that, as part of the 75th anniversary celebrations, objects of special interest along the route, such as churches, viaducts, power stations, and historic memorials, and some of the natural scenery, are being floodlit from dusk to well after midnight until October, 1957.

"In this manner," the leaflet states, "the famous thoroughfare for peoples of all nations will appear as an illuminated path through the country, especially so in the actual mountainous parts between Belinzona in the south and the Lake of Lucerne in the north."

"Inside the Gotthard Tunnel itself—where not only the Swiss Cantons of

Uri and of Ticino but also two different cultures and languages meet, and where the waters flow towards the Mediterranean on the one side and towards the North Sea on the other—a line of lamps, about 656 ft. in length, with the illuminated coats of arms of both Cantons at each end, will draw the attention of the passing traveller to this remarkable spot.

"Any further details you may like to have will be given to you by the train conductors, as far as their normal duties allow them to do so."

"With this we wish you a happy journey and au revoir on the Gotthard."

Piano on the Platform

Anyone looking for a record for the "silly season" could hardly do better than go for one called "Candid Mike" issued recently. . . . The candid mike is that of Mr. Jonathan Routh, a professional hoaxer, who with his tape-recorder has perpetuated some of the most unlikely conversations imaginable. The idea is that Mr. Routh chooses an improbable situation and hoodwinks his unwitting victims into making the entertainment. . . . The climax comes when Mr. Routh and friends take a grand piano down the Underground and get stranded with it on No. 2 platform at Camden Town. It is enough to say that bureaucracy runs riot.—*From "The Manchester Guardian."*

Hail "Caledonian"!

(The 387-min. run of the "Caledonian" from Glasgow Central to Euston; see our August 16 issue)

Long, long ago, Sir Walter Scott,
In Scotia's praise poetic,
Apostrophised his countrymen
In stanzas energetic.
But Caledonia, stern and wild,
May call and call in vain
When Scots wha' hae leap to the lure
And board the southbound train.
It may not be the Golden Road
To far off Samarkand,
But it runs down to London Town
And fortunes in the Strand.

This is a record-breaking age,
With speed its lord and master,
As mankind strives with might and main

To get to somewhere faster,
And when the "Caledonian,"
With Caledonians in it,
Goes hurtling south at record speed,
Beating a mile a minute,
Not one of them would be averse
To burning up the track,
Though to be sure, I've heard it said,
They're slower going back.

And, if these ancient optics glint
With a sardonic gleam—
Well . . . they *did* beat the record, and
They did it all on steam!

A. B.



Director's silver pass of the Newcastle & Carlisle Railway Company, now on exhibition at the Railway Museum, York

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Durban-Booth Quadrupling

Because of the density of traffic on the Rossburgh-Durban double line the need for quadrupling the Durban-Booth section became apparent and work on this project was started approximately two years ago. The double line from Durban to Rossburgh branches into four directions, along the old double main line to Pinetown, the new double line via Mariannhill, the South Coast double line, and the Bluff double line.

The main line from Durban to Booth passes through the industrial area of Durban, which results in many train and engine movements across the main lines. With the quadrupling of this section and the increased train movement it was necessary to provide flyovers. About one-third of this project is completed.

RHODESIA

New Passenger Station at Bulawayo

Another stage of the Bulawayo station rebuilding scheme was reached recently, when work was started on lifting one of the four tracks in the old "docks" on the west of the station preparatory to linking the remaining three tracks with those to the east of the concourse. The platforms are being widened and the concourse split. All platforms have been renumbered.

ANGOLA

Moçamedes Line Progressing

Construction eastwards of the Moçamedes Railway is reported to be making good progress.

Four 2-8-2 steam locomotives, with a tractive effort of 28,500 lb., are being supplied by Arn. Jung Lokomotivfabrik. They are oil-fired but can, if necessary, be adapted for wood burning.

Repairs, maintenance, and overhauls on these and other locomotives will be carried out by the new workshops now being erected and installed at Sa da Bandeira. Manufacture of certain parts, precision jobs, and other specialised work will continue to be done in the general workshops at Luanda.

NEW ZEALAND

Deliveries of British-Built Wagons

The Minister of Railways, Mr. J. K. McAlpine, has reported that delivery of the 2,500 new freight wagons being made in Britain, including 1,550 "LC" type four-wheel open steel wagons being constructed by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., has started. Regular shipments are expected until December, 1958.

CANADA

Lightweight Streamline Train Tested

The "Aerotrain," the General Motors lightweight experimental streamline train, has been tested recently in Canada for the first time, over the lines of the Canadian National Railways.

The tests have been part of the C.N.R. programme of keeping abreast of all new developments and acquainting engineering and operating staff with the performance qualities of new passenger equipment in Canadian conditions.

The train is headed by a 1,200-h.p. single unit diesel locomotive of radical exterior design. Each of the 10 coaches seats 40. The short four-wheel vehicles ride on air springs and are an adaptation of the General Motors 40-seater inter-urban type bus body. The standard bus body was widened to provide more aisle space, lengthened by adding vestibules and washrooms, and placed on a railway type underframe.

The low centre of gravity allows of a high average speed. The passenger coaches are air-conditioned, and besides the standard baggage racks, heavy baggage can be stored in lockers under the floor. The train is designed for "coach" travel in fast interurban services and does not include restaurant or sleeping cars.

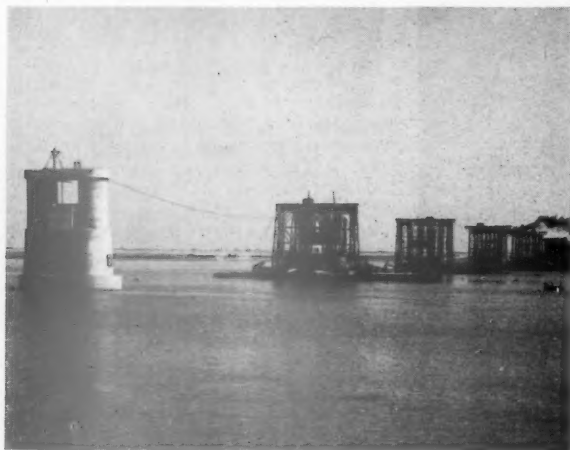
UNITED STATES

80-m.p.h. New York-Boston Service

One of the experimental lightweight trains introduced recently on the New York, New Haven & Hartford Railroad, the "Roger Williams," is to be put on a schedule which will entail an average speed of 82.4 m.p.h. over the 206 miles between Woodlawn, outside New York, and Highway 128, a new stop outside Boston where the New Haven main line crosses the arterial road concerned. This distance is to be covered in 2½ hr., including five intermediate stops and numerous speed restrictions for drawbridges over inland waterways.

The "Roger Williams" consists of six railcars of the 600 h.p. "RDC" type coupled, providing a total of 3,600 h.p. for a total train weight of 334 tons,

Progress on the Mokameh Ganges Bridge



Construction of the main piers of the Ganges bridge at Mokameh in March, 1957



General view, in May, from the same point, of the completed piers

with seating accommodation for 424 passengers. Initial acceleration is 1.18 m.p.h. per sec., which makes it possible on level track to attain 65 m.p.h. in 2 min. from the start, 100 m.p.h. in 5½ min., and 110 m.p.h. (the maximum) in 7 min. A speed of 100 m.p.h. can be maintained on 60 per cent of the total output of the 12 motors, which means that the schedule can be maintained even if several of the engines or motors have failed.

SWITZERLAND

Rhaetian Railway Developments

Work is proceeding actively on a doubling of the principal main line of the Rhaetian Railway, from Chur to St. Moritz via Thusis, over the 6.1 miles between Chur and Reichenau-Tamins, junction for the Disentis line, in order to accommodate the constantly increasing passenger and freight traffic. This will be the first double-tracked section of the Rhaetian system, and the additional line is expected to be ready for the summer service in 1958.

Progress is being made in the introduction of new and very handsome first and second class composite coaches of the centre corridor type, which are now used almost exclusively for the through Chur - Pontresina and Chur - Scuol (Schuls-Tarasp) workings. These are distinguished externally by a broad stainless steel band running the length of each coach below the window level.

The increasing weight of passenger trains on the main line is beginning to outstrip the capacity of the ten existing Bo-Bo locomotives used on the principal services, which are limited to 220 tons of train between Chur and Filisur, over a ruling gradient of 1 in 40,

and to 180 tons between there and St. Moritz, over a ruling gradient of 1 in 29 (these tonnages include a 10 per cent allowance for passengers and luggage, and are therefore equivalent to about 200 and 165 tons tare). As the latter figure represents about eight coaches of standard corridor stock only, a good deal of double-heading of express trains is needed in the height of the summer and winter seasons. To eliminate this use of assistant locomotives as far as possible, a new type of electric locomotive with the unique Bo-Bo wheel arrangement has been designed, and is now in course of construction.

FRANCE

Train Fire in Blaisy-Bas Tunnel

Details have been published of the very great dislocation to traffic on the Paris-Lyons line caused on the evening of January 26 last when fire broke out in a wagon loaded with cotton waste. A freight train had been examined at Les Laumes and a very faint smell of burning was noticed. The examiners could trace nothing, however, but the vehicle was seen to be on fire by the station supervisor at Blaisy-Bas who, thinking it the best way to avoid extensive damage to the overhead equipment, asked for power to be cut off in the tunnel section, where endeavours to deal with the trouble by ordinary hand extinguishers proved fruitless. The fire brigade had to be summoned and water brought to the site in some locomotive tenders. Meanwhile two expresses were standing at Blaisy whence a number of passengers were sent forward by road.

When it was thought that the normal

route would become clear again within a calculated interval, other trains were despatched over it, but in turn met with serious delay through collapse of the catenary at Blaisy-Bas itself, where a weak spot had been created when a train ran from a live to a dead section. Diesel locomotives had to be used to get these trains away.

Rail-Air Connection

Until recently, the only connecting service from the station at Bourg-St. Maurice for passengers travelling between Paris and Val d'Isère was by road, the 35-mile journey, when not entirely prevented by snow, occupying more than an hour. A helicopter service has now been introduced, which covers the same journey, virtually independent of the weather, in 14 min. A representative of the air undertaking travels in the train between Chambéry and Bourg-St. Maurice, and places can be reserved either through him or, in advance, at offices dealing with sleeping car reservations.

WESTERN GERMANY

Basle-Karlsruhe Electrification

With the recent extension of electrification northwards to Karlsruhe from Offenburg, the whole of the main line from Basle to Karlsruhe is now electrified. Completion of the remaining section of the Basle-Heidelberg-Mannheim line, from Karlsruhe northwards to Bruchsal, is planned to coincide with the introduction of the winter timetable on September 29. For the time being, D and FD trains only are to be electrically hauled. Conversion of the Karlsruhe-Mannheim section is due to be completed early in 1958.

Publications Received

Archiv für Eisenbahnwesen (Railway Historical and Statistical Journal). Sixty-seventh year, volume I; 132 pages, 10 in. x 6½ in. Published about four times annually by German Federal Railway at 43, Platz der Republik, Frankfurt (Main). Price DM. 66 for one year.—This well-known source of information, particularly of a legal, financial, or historical character, on railways in all parts of the world, founded in 1878, had to suspend publication during the war and its re-appearance after some 15 years will be welcomed. An introduction over the signatures of Messrs. Frohne, Hatje and Schelp, until recently the Board of Management of the German Federal Railway, is followed by informative articles on the history of the journal, the privately owned railways in Germany, and the Netherlands Railways for the period 1942-1955. Working reports and results of the German Federal Railway for 1956 and the Austrian and French railways for 1955 are analysed. Some book reviews follow, with the texts of several laws

pertaining to transport enacted recently in Germany. These articles are of especial value to students of the legal situation as it affects rail transport or of the economic and political trends influencing the policy of the authorities concerned towards railways.

Top-Link Locomotives. By Norman McKillop. Edinburgh, 9: Thomas Nelson & Sons Limited, Parkside Works. 8 in. x 5½ in. 187 pp. + 15 pp. plates. Price 12s. 6d.—“During the many years I have been driving high-speed trains,” states the author in his preface, “many ‘boys’ from seven to 70 years of age have asked me thousands of questions. I’ve done my best to answer them, but how much better could I have done if I’d been able to say, ‘Hop into the cab, son, and I’ll show you.’” In the first part of this book, Driver McKillop takes the reader for a journey on an “A4” Pacific with the up “Queen of Scots,” and then, as a “dyed-in-the-wool steam driver,” reviews other forms of railway motive power. The racy style, and simple explanations by a British Railways top-link driver of locomotive

characteristics and performance, should appeal greatly to younger readers. Mr. R. F. Harvey, Chief Operating & Motive Power Officer, British Transport Commission, contributes a short foreword.

Kereta Api (Malayan Railway Administration Magazine). The first issue of the new quarterly, that for May, 1957, of *Kereta Api* (the Malayan words meaning “railway”), contains messages of goodwill from Tunku Abdul Rahman Putra, Chief Minister, and from Mr. Ong Yoke Lin, Minister for Transport, Federation of Malaya; from Mr. F. Thomas, Minister for Communications & Works, Singapore; and from Mr. C. G. Harrison, General Manager of the Malayan Railway. There are also articles by Mr. Ong Yoke Lin on the history and rôle of the railway, and by Mr. D. D. Bartlett, Acting General Manager, on future plans, besides particulars of railway and port traffics, and staff news. The 24-page periodical is produced by and obtainable from the General Manager's Office, Malayan Railway, Kuala Lumpur; no price is stated.

Employment, Productivity and Safety Questions

Position on railways in various countries outlined in a report considered by the I.L.O. Inland Transport Committee

(By a correspondent)

THE Sixth Session of the Inland Transport Committee of the International Labour Office was held recently in Hamburg. The agenda included the study of a report on recent events and developments in inland transport prepared by the International Labour Office, the greater part of which is devoted to problems affecting railways. The two previous sessions were of particular significance to road transport: the Fourth Session at the end of 1951 discussed the labour problems arising out of transport co-ordination, whilst at the Fifth Session, in 1954, the main theme was road transport; and it was felt appropriate that the emphasis at the Sixth Session should be on railways.

It was decided to concentrate on certain aspects which can be grouped under three main headings, namely, the effect on labour of technical progress in the railway industry, the operation of incentive and bonus schemes, and safety of staff.

Railway Recruitment Problems

There has been, in recent years, a radical change in several countries in the relative position of railway employees in the national economy. Before the war, employment on railways was much sought after because of its relative security compared with other industries; but railways are now finding it difficult to retain old staff or to recruit new entrants. The present "full employment," where it exists, has caused the disappearance of a principal advantage possessed by railways; labour is tending to flow to industries offering, in many cases, higher earnings and, in general, more attractive conditions. The report attempts, therefore, to consider in more detail the main changes which have come about as regards employment, conditions of work and labour-management relations on railways.

On railways, two tendencies show themselves with regard to demands for staff. There is a short-term trend, which may be up or down, according to changes in the volume of traffic handled, and a long-term tendency to a reduction of demand arising from organisational and technical improvements. The report shows how in many European countries, at the present time, railway staff is being reduced whilst traffic is increasing. Thus on the French National Railways (S.N.C.F.) there has been, since 1936, a fall of more than 27 per cent in the number of staff employed, whilst during the same period passenger-miles have increased by 25.8 per cent and ton-miles (revenue earning) by 76.6 per cent. In terms of traffic units (passenger-miles plus ton-miles) for

each hour worked, efficiency has increased since 1938 by 85.4 per cent. In the U.S.A. the efficiency of the railways is claimed to have practically doubled between 1935 and 1955.

Technical Developments

Reference is made to the British Railways modernisation plan, covering, inter alia, a change from steam to diesel and electric traction, the fitting of continuous brakes to all goods wagons, improvements to track and signalling, and the remodelling of goods and passenger terminals and yards. The Sixth Five-Year Plan in the U.S.S.R. includes the laying of 4,000 miles of new railway track and the electrification of some 5,000 miles of line. Electrification on the S.N.C.F. and reorganisation of methods of work on the Italian State Railways are amongst the other items to which reference is made.

The I.L.O. devotes particular attention to the problem of automation which it was asked to keep under review by the International Labour Conference. The effect on employment of the growing use of centralised traffic control and of the automatic controls introduced in marshalling yards is given special emphasis. The growing tendency towards the mechanisation of accountancy operations will also entail considerable reductions of staff.

Another matter of topical interest to which reference is made is the use of work study techniques on railways. To encourage the co-operation of railway employees it is considered essential to make clear that work study differs vitally from the old conception of time and motion study. The increased use of containers and pallets and the provision, particularly in the U.S.A., of the "piggy-back" service, of loaded road vehicles carried on railway wagons, are also cited, but it must be borne in mind that, although these methods reduce handling, they have been introduced in an effort to obtain new traffic, and may have the over-all effect of increasing the demand for railway staff.

Fear of Redundancy

It is clear, however, that in recent years there has been a reduction in employment opportunities on many railways, although local shortages of railway employees have occurred in certain grades. This had led to a fear of redundancy. The report claims that, to maintain morale, the planning of staff changes resulting from changes of technique should be carried out in consultation with the workers concerned. In practice, such changes can usually be spread over a lengthy period and necessary reductions in numbers

of staff occasioned by normal attrition.

If workers are not to become redundant in such circumstances, however, they must be prepared to be placed on another job and, possibly, to move their homes. The staff reductions on the S.N.C.F., to which reference has already been made, are estimated to have brought changes of residence to some 200,000 employees and dependants. Perhaps the most obvious current change of grade is the re-training of steam locomotive drivers to handle diesel and electric locomotives. In some countries, notably Great Britain, it has been possible to use staff normally employed on maintenance and repair for rolling stock construction work.

Whilst the long-term trend has reduced the demand for labour, some railways have experienced serious shortages of manpower in certain grades. Recruits have not continued to be attracted to the railways in sufficient numbers to make up for normal wastage. Thus, in 1956, British Railways were reported to be short of 26,000 men, more particularly in the operating and engineering grades. Although in many cases staff can be re-trained, new techniques call for additional recruitment for highly qualified civil and mechanical engineering staff.

Railway Work Less Attractive

The various factors which have made railway employment less attractive are analysed in the I.L.O. report. In summary, these are all said to be the result of the fact that in certain countries railway conditions of employment do not compare favourably with those in other industries. In the U.S.A., railway employees were considered, in 1936, to enjoy the third highest conditions of wages and employment in comparison with other basic industries; in 1948 they are said to have fallen to 25th. As the report itself admits, this loss of status is due very largely to circumstances outside railway control, for example, restrictions on capital investment and statutory obligations making difficult competition with road transport. It is for consideration whether railway financial difficulties can be resolved, however, now that the position in this respect is being changed in some countries. A positive approach to the problem of increasing productivity is called for from both employers and employed. Due regard also must be had to improving the relative position of those senior staff who have suffered from the evening-up process since the war.

Labour-management relations, the report states, are vitally important in increasing productivity. The establishment of the British Railways Productivity Council with management and trade union membership is acknow-

ledged as a notable step. The importance of the speedy handling of disputes is stressed by the I.L.O., and examples are given of long and frustrating delays which have occurred in the U.S.A. The examples cited, showing an average delay of a year to settle major wage claims, do seem to indicate a too elaborate and overburdened negotiating machinery, but without studying both sides of the picture it is not possible to make a balanced judgement. The lodging of too many and intemperate claims makes prompt settlement difficult.

Incentive Schemes

Perhaps the most valuable part of the report is that dealing with incentives and rewards for railwaymen. It is largely factual and sets out little-publicised information on the types of incentive scheme in operation on a number of European and other railways. At the Fifth Session in 1954, the Mexican delegation sponsored a resolution calling for the incorporation of a study on incentive schemes on the agenda of the Sixth Session. Although it was not included as a separate item, the I.L.O. was asked to include a survey of the subject in the present general report. A questionnaire was despatched to a number of railways and this section of the report is largely based on replies received from railways in Belgium, France, Italy, Japan, Sweden, Switzerland, the Union of South Africa, and the United Kingdom.

In introducing this survey, the point is rightly made that the introduction of incentive schemes is generally much more difficult on railways than in most other industries. In a factory or workshop it is comparatively easy to measure the standard output of an individual, whereas on railways ton-mile or passenger-mile "output" may depend largely on factors outside the individual worker's control. The scope covered by the report is defined as any regular payment made to provide a reward additional to current salaries or wages for output in excess of an established standard, for output of a better quality, or for an economy made in relation to certain specified expenses. It specifically excludes various systems of payment by results in railway workshops, as these are similar to those in operation in any engineering shop or factory, and payments on a mileage basis to train staff.

Productivity Bonus in France

Of particular interest is a scheme on the S.N.C.F. whereby staff in general qualify for an over-all productivity bonus based on economy in man-hours worked in relation to traffic units handled; the report refers to 1951 as being the base year, but in fact this was recently changed to 1954. Earnings of S.N.C.F. railwaymen were increased by 14 per cent between February, 1953, and September, 1955, as a result of this scheme. Other general types of scheme are a traffic promotion bonus on the German Federal Railway, and an out-

put and "assiduity" bonus on the Italian State Railways.

Apart from the over-all productivity bonus, the S.N.C.F. has promoted individual output bonus schemes for almost all grades of staff. Thus there is an administrative service bonus for all office staff of the central, regional and district offices who are not covered by other schemes; this bonus applies to about 43,000 employees and represents about 3.5 per cent of all other elements in their salaries. For station staff not coming within any other scheme there is a station productivity bonus, whilst the report also specifies S.N.C.F. schemes for, inter alia, locomotive crews, marshalling yard staff, workshop and depot staff, train crews and permanent way staff.

Except for that for locomotive crews, most of the S.N.C.F. schemes are collective in character. Thus the permanent-way bonuses are based on the efficiency of length gangs, whilst the marshalling yard bonus covers all employees at the yard. The collective bonus is shared in accordance with the employee's grade and the number of days worked at the yard, etc., in any one month. The permanent-way bonus affects some 37,000 persons and is equivalent to about 6 per cent of other elements in their wages.

Apart from the bonuses mentioned in the I.L.O. report there are others on the S.N.C.F., some of which seem to be problematical in their incentive aspect. All booking office staff dealing with the sale of tickets and their accounting qualify for a receipts bonus, goods office staff benefit by a goods office bonus, whilst there is a handling bonus for all employees engaged in handling goods, checking wagons, sealing wagons and similar tasks; one somewhat bizarre bonus is an arrests' bonus for railway policemen. The bonuses are generally made up of both positive and negative elements.

Other European Schemes

The opportunity has been taken to record in some detail the comprehensive nature of the incentive bonus schemes on the S.N.C.F. since this administration provides virtually 100 per cent cover for its staff. Similarly, most grades of staff on the Italian State Railways come within the scope of the output and assiduity bonus, although for a few categories of staff specific schemes exist. Bonus schemes for many grades of staff are also operated by the German Federal Railway and the Belgian National Railways. Particular mention ought perhaps to be made of the bonuses for engine staff on the latter system since these account for a high proportion of total earnings; thus, they are equal to over 40 per cent of a steam locomotive driver's basic wage. These bonuses are made up of elements for fuel economy, maintenance and punctual running. Other bonuses in Belgium are not considered to be large enough to have any appreciable bearing on the level of earnings.

The German Federal Railway also

provides bonus schemes for many grades of employee including the loading staff at goods depots, locomotive crews, some staff in marshalling yards and staff at locomotive depots. There are also one or two unusual types of bonus, such as the payment to train staff of a percentage of fines levied on passengers smoking in certain compartments, a commission on supplementary fares collected, and a language bonus to staff in international trains.

Some 80 per cent of staff on the Belgian National Railways and 40 per cent on the German Federal Railway qualify for bonuses. The schemes in Great Britain and South Africa are much less comprehensive, being applicable to 10 per cent of British Railways staff and 18 per cent of the staff of the South African Railways & Harbours. The average bonus paid by this latter administration to employees affected, however, amounts to nearly 40 per cent of the basic wage.

Improved Management-Staff Relations

The I.L.O. report stresses that most railways employing a bonus incentive system believe that this has proved beneficial both financially and in the improvement of labour-management relations. A particularly valuable point in this latter respect is the taking into account by the German Federal Railway and French National Railways of bonus payments for pension purposes. It is shown, however, that many administrations do not use such schemes at all. The I.L.O. rightly emphasises that incentive bonuses are not a substitute for a well-conceived wages system. Furthermore, it is thought, as is the case on many railways, that there should be preliminary consultation with workers' organisations on the details of schemes before they are applied.

Necessary Characteristics of Incentives

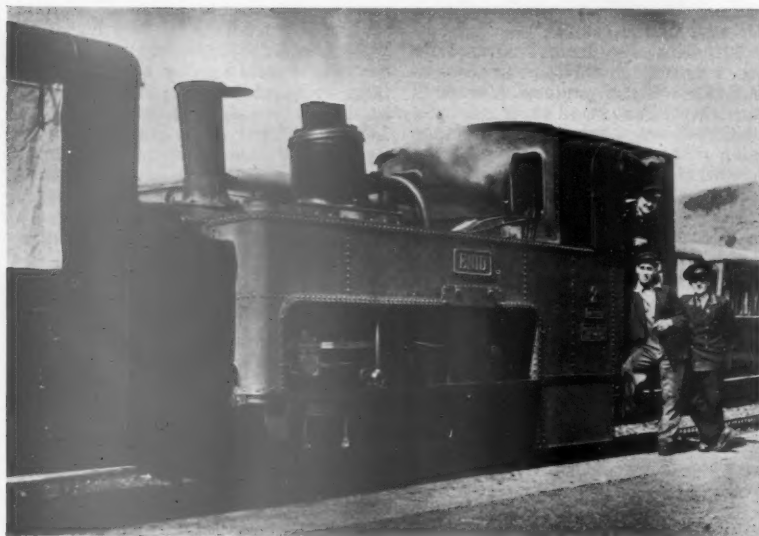
Certain general conclusions on the nature of incentive bonus schemes are set out in the report. There should be a close and easily understandable relation between the effort and the resulting reward, and for this reason individual bonuses are best where these can be arranged. As the report has shown, this is not often possible with railway incentive schemes. The link in time should also be close, payments being made as soon as possible after the work has been carried out. It is desirable for the scheme to be comparatively simple, for the staff will enter into it more willingly where they can calculate for themselves what is due to them. Simplicity is also eminently desirable from the administration's point of view, since if administrative costs are high the scheme may not be worth while.

Every effort should be made to establish a sound basis for bonus schemes since workers are likely to be resentful if the basis is changed to their detriment. Whilst the report appreciates that changes may become

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Track Maintenance During Restricted Period

Problem of maintaining Snowdon Mountain rack line between Spring thaw and holiday traffic season



One of the original (1895) locomotives. Cylinder dia. and stroke are nearly 12 in. and 24 in. respectively. The long stroke is reduced to match the smaller crank throw by a rocking-lever system

THE inaccessibility for climatic reasons during the winter of track at altitudes of up to some 3,500 ft., and an intensive summer tourist traffic beginning in April, greatly curtail the period available for track maintenance on the 2 ft. 7½ in. gauge Snowdon Mountain Railway. The line was built in 1895 and is still the only rack

railway in Britain; the rack used is of the Abt type. Wear on the track is necessarily heavy.

As applied on the S.M.R., the Abt system consists of an upright twin rack in which two sets of double pinions on the locomotive engage. The teeth on the racks, and on each pair of pinions, are staggered so that two teeth

are always fully engaged and the tendency to "ride up" the rack is eliminated. An additional safeguard, in the shape of guard rails on either side of the rack and arranged to engage with grippers under the engine, was incorporated after an accident to the first passenger-carrying train. Apparently frost, and the lack of bedding down of the track, had introduced distortion sufficient to derail the engine. Whatever the reason, the condition has never been reproduced, so that the guard rails have never actually been called on to prevent a potential derailment.

In the six-wheel locomotives, designed and built by the Swiss Locomotive & Machine Works, Winterthur, the entire tractive effort is transmitted by the pinions, while the wheels run free on the axles. Each crank pinion is fitted with large brake drums, arranged to give positive braking on the rack. The brakes are automatically engaged if the speed exceeds 5 m.p.h.

Such precautions are necessary, as the railway climbs from Llanberis, 353 ft. above sea level, to 3,483 ft. at the summit in less than 4½ miles, an average gradient of about 1 in 8. Nearly 60 per cent of the distance rises more steeply than this, while the maximum gradient, over two stretches near the top totalling nearly three-quarters of a mile, is 1 in 5½. The minimum gradient, apart from the short stretch out of the Llanberis terminus, is 1 in 20.

For the most part, the rails, sleepers and rack are original equipment, exactly as laid over 60 years ago. The



Building up a crossing nose with Alda wear-resisting alloy steel, using portable equipment



The same equipment as in left-hand illustration being used for rapid cut through rail



Staggered racks between guard rails. Gradient beyond bridge is about 1 in 6

locomotive shown in the accompanying illustration is one of the three originally supplied in 1895, and with another of the same date is still in regular service, as are two more delivered in 1896. Three further locomotives were built in 1922-23. All the locomotives are fitted with compression braking. Locomotive maintenance work can proceed in the sheds uninterrupted from about October to April.

Track maintenance is a different matter, as inspection and repair must

be carried out between the spring thaw and April.

Equipment for track maintenance includes BOC oxy-acetylene welding and cutting gear. The welding rod is of Alda wear-resisting alloy steel, which is quite simply applied, using a slight excess of acetylene to give a carburising flame. The deposited metal, which may be applied up to about $\frac{1}{4}$ in. in thickness, is hammered to shape while red hot.

This method of building up worn

surfaces, which provides a more wear-resistant finish than the original rail, can be repeated as often as required.

Use of Portable Equipment

The work is done in a very short time, a point of special value where, as in this case, maintenance must be carried out quickly. It eliminates the need to carry whole sections of rail, or crossings, up the mountain. The complete equipment, consisting of the oxygen and acetylene cylinders and the standard torch, can be put in the guard's compartment of one train, dropped off where it is required, and the work completed before the next train is due.

A cutting torch, working off the same cylinders, cuts through rails in less than 2 min. and provides a quick means of cutting bolt holes in fishplates and rails. The type No. 5 (used by the S.M.R.) weighs 4 lb. Uses include the cutting out of the $\frac{1}{4}$ -in. mild steel shutters which are fastened over the windows of the Summit Hotel in the off season, to prevent them being blown in by the heavy winter gales.

Welding equipment is used all the year round on repairs to engine boilers and frames, besides general structural work. For steelwork, the general-purpose S.M.1 rod, which produces a weld with a tensile strength of over 28 tons per sq. in., is almost universally used. Copper pipe work is bronze-welded with Brazotectic rods which give a very strong joint without overheating the copper; Brazotectic and Bronzotectic rods are also used for building up worn shafts and other wearing parts. The manganese bronze rod is particularly suitable for repairs to malleable iron parts, which cannot be fusion-welded without destroying the properties of the tough outer skin.

Employment, Productivity and Safety Questions

(Concluded from page 215)

necessary as the result of alterations of method or technical changes, it does not emphasise that a modernisation scheme, such as that being developed by the British Railways, would make occasional changes of base essentials. If an administration turns over from steam to diesel shunting in marshalling yards, this must have a fundamental effect on operations and must be accepted by staff as necessitating a change of basis.

Safety and Health

A chapter report deals with the highly important subjects, from the management-staff relationship point of view, of safety and health. This section reviews developments in this field since the previous Session three years ago. Considerable attention is given to shunting accidents. In accordance with the recommendations of the I.L.O., many railways, including most of those of Western Europe, have continued to make enquiries into accidents, to collect

statistical information, to improve safety standards and to develop safety training and first aid.

Amongst the developments cited are the lighting of marshalling yards by flood lights on steel towers, the replacement of signalling lamps in Austria by portable electric lamps, the equipping of yards in the Netherlands with loud speakers and the general tightening up of regulations regarding wagon coupling. The report refers to a demonstration at Geneva of a wagon coupling which is said to eliminate much of the need for shunters to go between buffers.

Automatic Coupling for Freight Wagons

The report refers to the question of automatic couplings for freight wagons and the large number of countries where such couplings are not used. This question has been under discussion on many occasions in Europe, particularly through the medium of the U.I.C., but the considerable capital cost and the fact that many risks would still remain have led to its deferment. Incidentally, the I.L.O. refer to the introduction by the Japanese National Railways of automatic couplings for

freight wagons in 1952; in fact the actual change over to automatic couplings for both freight and passenger stock, following earlier preparatory work, was completed on a single day in July, 1955.

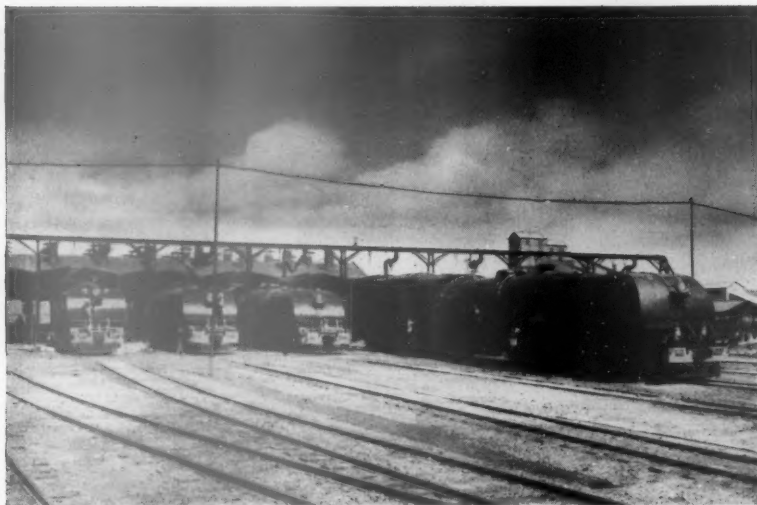
Other matters dealt with in this section of the report include the classification and labelling of dangerous substances, standards of fitness for motor vehicle drivers, and safety and health in docks.

International Labour Code

From time to time the I.L.O. Inland Transport Committee agrees international conventions and recommendations regarding conditions of employment of labour. After ratification the conventions become obligatory in the countries concerned, whilst the recommendations carry considerable weight. The final chapter of the report reviews alterations and additions to the International Labour Code since the code was published in 1951. Amongst the matters dealt with are the employment of children and young persons, industrial health, safety and welfare, social security, and industrial relations.

Steam Motive Power in Rhodesia

Work of existing and new "20th" class Beyer-Garratt locomotives



"20th" class Beyer-Garratt locomotives outside Bulawayo running shed

AS recently announced, the Rhodesia Railways have decided to invest some £3,000,000 in Beyer-Garratt steam locomotives. The Beyer-Garratt, in the form of the "13th" class, was originally introduced by Rhodesia Railways to improve the capacity of the line, then operated by them, from Vila Machado (P.E.A.) to Umtali; the "13th" class went into service on this heavily-graded section almost exactly 30 years ago. When delivery of the 46 "20th" class locomotives now on

order is completed by Beyer, Peacock & Co. Ltd., Rhodesia Railways will have purchased 250 Garratt-type engines.

Heavy Traffic

The estimated increase in traffic and the heavy occupation of some sections of the main line from Umtali to Ndola were the important factors. Even with the envisaged C.T.C. signalling installation throughout the distance of 1,246 miles between these points, the

tonnages to be worked necessitated heavy loads and, therefore, heavy locomotives.

Although the report of the consultants regarding the type of power—steam, diesel-electric, or electric—to be used on the Rhodesia Railways in future has not yet been received, it was impossible to defer orders for additional power without seriously limiting movement in 1957-59.

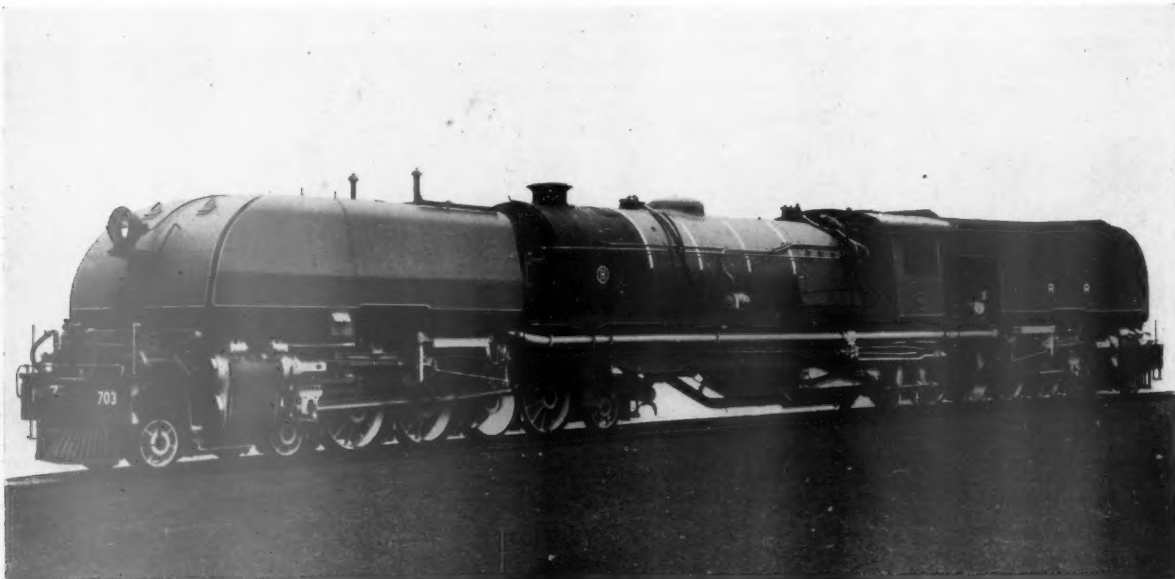
At present, some of the "20th" class locomotives are stationed at Broken Hill and are employed in working trains on the section Kafue-Broken Hill. Kafue to Broken Hill is the loaded direction, and for "20th" class locomotives a 1,400-ton train is permissible.

The time allowed to cover the 107 miles, in the case of goods trains, is approximately $7\frac{1}{2}$ hr. A load of 1,400 tons on the whole Northern Rhodesia section from Livingstone to the Copperbelt (Ndola) will, it is hoped, become permissible for goods trains when the development plans are fulfilled. The "20th" class locomotives are designed to operate on 80-lb. rail and their use on the section north of Broken Hill is dependent on the completion of relaying to Ndola.

Increased Tonnages Worked

At present 11,500 gross tons are cleared to the north of Kafue on an average day, whilst 7,000 gross tons is the equivalent figure from Broken Hill in the southerly direction. Improve-

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Rhodesia Railways "20th" class 4-8-2 + 2-8-4 3 ft. 6 in. gauge locomotive, built by Beyer, Peacock & Co. Ltd. These engines, which weigh 225 tons in working order, and exert a tractive effort of 69,330 lb. at 85 per cent boiler pressure, were described in our issue of January 28, 1955

Standard 35-ton Tank Wagons for British Railways

Four-wheel vehicles for high-speed conveyance of liquids in bulk



Wagon designed to carry class "A" liquids on British Railways, fitted with roller bearings and vacuum brakes

THE decision of the British Transport Commission to improve freight services in this country by higher train speeds with the wider application of the vacuum automatic brake, roller bearings, and so on to goods vehicles, necessitates improved designs of this category of stock in a wide range of wagon types. Three prototype tank wagons, which will become standard for British Railways, were on view recently in Marylebone Station, London, as recorded in our August 2 issue, and illustrate some of

the latest developments in four-wheel wagon design.

The vehicles were built by Charles Roberts & Co. Ltd. of Wakefield, being the completion of the design contract entrusted to the manufacturer by the Commission some 12 months ago, for a tank wagon suitable for the conveyance of bulk liquids at high speeds.

The three wagons demonstrated represent three variants of a common basic design to suit particular materials. These are a Class "A" vehicle suitable for the conveyance of inflammable

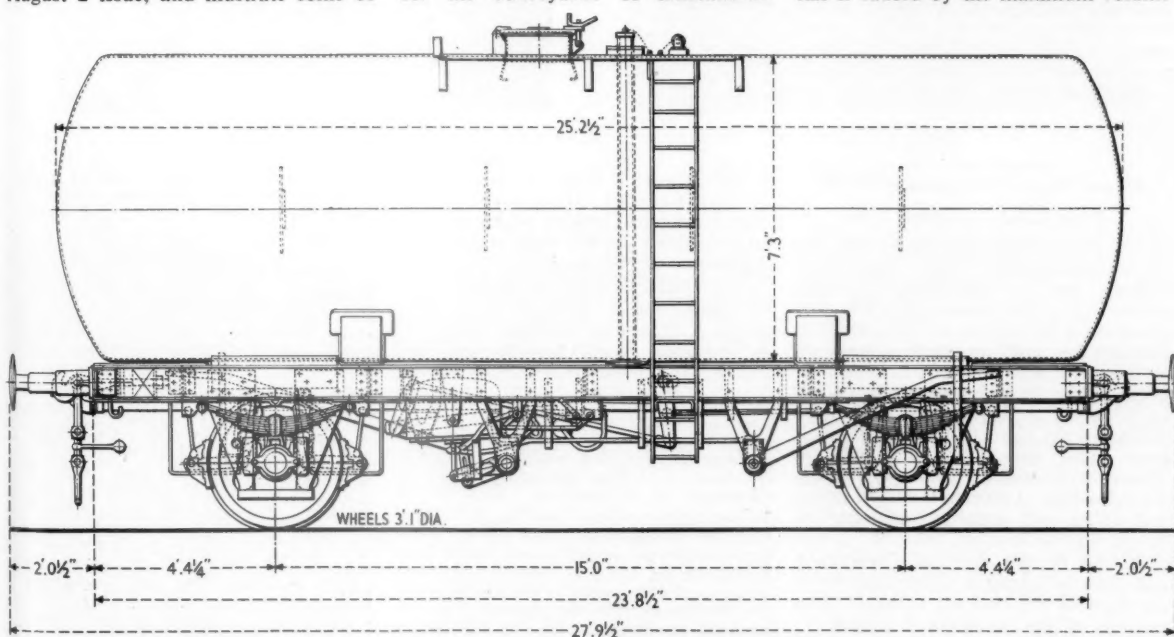
liquids of a flash point lower than 73°F.; a Class "B" wagon for the conveyance of heavy liquids and chemicals, with steam heating coils, and arranged for bottom discharge on either side of the vehicle; and a creosote tank wagon for British Railways service requirements, fitted with steam coils and with bottom outlet discharge arrangements.

Underframe

Designed basically on a 15-ft. wheelbase, they have a length over headstocks of 23 ft. 8½ in. and an overall length of 27 ft. 9½ in. to comply with the ratio of wheelbase to length over uncompressed buffers of 0.54; all three vehicles have similar underframes of riveted construction. The main members of the underframe are of 10-in. × 3½-in. × 24.46-lb. R.S.C. except for the longitudinal members at the tank anchorage, which are of 10-in. × 3.62-in. × 28.54-lb. channel. The top and bottom gusset plates at the ends of the frame and at the cross members are ⅝ in. thick.

The tank barrels, designed to maximum capacity, are of butt-welded construction, the ends being self-dished and flanged, of ¼-in. mild steel plate. The circumferential shell plates are ¼-in. thick mild steel except at the tank anchorage, where they are ⅞ in.

The Class "A," Class "B," and creosote barrels have a gross capacity of 6,149 gal., 5,370 gal., and 4,880 gal. respectively. The variation in barrel size is caused by the maximum volume



Tank wagon for class "A" liquids with a capacity of 6,149 gal. gross, 5,903 gal. net, designed for a gross weight of 35 tons. These wagons have two 22-in. vacuum brake cylinders



Tank wagon for class "B" liquids fitted with steam heating coils and with bottom discharge outlets in both sides

of liquid at various specific gravities that can be carried within the maximum registered gross weight of 35 tons.

Tank Details

The manholes are of standard type but reduced slightly in overall height. On the Class "B" and creosote carrying vehicles, the screwdown handwheels have been arranged so that clockwise rotation of the wheels will close the bottom outlet valves. The tank is secured to the underframe by four anchor angles of 8-in. \times 4-in. \times $\frac{1}{2}$ -in. section and rests upon two pairs of mild steel supports, behind which doubling plates are welded to the barrel.

The bearing springs have eight plates each of 4-in. \times $\frac{3}{8}$ -in. section with hook ends and plain hoops, and are mounted in standard spring shoes. The draw-gear is of the short type with international hooks and screw couplings.

Standard rubber draw springs are

fitted and mild steel rocking washers inserted between the rubber springs and the frame knee to permit lateral movement of the drawhook. The buffers are of the self-contained pneumatic type, two vehicles being fitted with buffers manufactured by Oleo-Pneumatics Limited and one vehicle with buffers by Dowty Hydraulic Units Limited.

For the two private owners' wagons for the ESO Petroleum Co. Ltd., the wheels are 3 ft. 1 in. dia. on tread with

2 $\frac{1}{2}$ -in. rims, the 4 $\frac{1}{2}$ -in. dia. journals being machined to suit either SKF or Timken roller bearing axleboxes. The British Railways creosote wagon is fitted with 3-ft. 1 $\frac{1}{2}$ -in. dia. wheels, 2 $\frac{1}{2}$ -in. rims, and axles with 9-in. \times 5-in. dia. journals to suit the Isothermos axlebox. To assess their behaviour in working conditions, each prototype vehicle is fitted with a different design of axlebox. The Class "A" vehicle is fitted with conventional type axleboxes with SKF roller bearings, the Class "B" with Timken roller bearing units and cast-steel horseshoe adaptors, both designs being suitable for 4 $\frac{1}{2}$ -in. dia. journals, and the creosote wagon with Isothermos oil axleboxes.

Besides the regulation side hand-lever brake, the wagons are fitted with automatic vacuum brake, utilising two 22-in. cylinders with direct admission valves, isolating cocks, and empty/loaded changeover gear. The brake rigging is so designed as to use one cylinder when the wagon is empty, capable of exerting a total braking force of 90 per cent of the tare weight of the vehicle and by means of the manually operated changeover gear, the other cylinder may also be brought into action, thereby giving an augmented brake force of 66 per cent of the gross weight on rails. Each wagon is painted in accordance with the British Railways requirements for private owners' wagons and service vehicles.

Leading particulars are as follow:—

	Class "A"	Class "B"	Creosote
Inside diameter of barrel	7 ft. 2 $\frac{1}{2}$ in.	7 ft. 2 $\frac{1}{2}$ in.	6 ft. 6 $\frac{1}{2}$ in.
Length inside barrel ends	25 ft. 1 $\frac{1}{2}$ in.	22 ft. 5 $\frac{1}{2}$ in.	24 ft. 7 $\frac{1}{2}$ in.
Length over buffers	27 ft. 9 $\frac{1}{2}$ in.	27 ft. 9 $\frac{1}{2}$ in.	27 ft. 9 $\frac{1}{2}$ in.
Length over headstocks	23 ft. 8 $\frac{1}{2}$ in.	23 ft. 8 $\frac{1}{2}$ in.	23 ft. 8 $\frac{1}{2}$ in.
Wheelbase	15 ft.	15 ft.	15 ft.
Overall height from rail	12 ft. 3 in.	12 ft. 4 $\frac{1}{2}$ in.	11 ft. 11 in.
Gross capacity	6,149 gal.	5,370 gal.	4,880 gal.
Net capacity	5,903 gal.	5,155 gal.	4,692 gal.
Buffers	Oleo	Dowty	Oleo
Axleboxes	SKF	Timken	Isothermos

Steam Motive Power in Rhodesia

(Concluded from page 218)

ments in tonnages will follow with the arrival of the new "20th" class locomotives with a consequent advantage to the Copperbelt industries. The first group of locomotives to this order is destined to reinforce those already at Broken Hill and to work towards the north. The second group is expected to be based on Livingstone and to be worked from there to the Wankie Colliery area, terminating the run at Thomson Junction. Bulawayo sheds are scheduled to receive the third group and these will usually work on the North line to Wankie.

All 60 of this class of locomotive will then be engaged in hauling trains on some of the heaviest mineral traffic sections of the Rhodesia Railways.

The locomotives are of 4-8-2 + 2-8-4 wheel arrangement, are 95 ft. long and weigh 225 tons in working order. The

water capacity is 8,000 gal. and 14 tons of coal is carried. They are equipped with mechanical stokers which is a big step forward in the improvement of enginemen's conditions.

The boiler, which is of all steel construction, has a grate area of 63.1 sq. ft. with a total heating surface of 3,772 sq. ft. Tractive effort at 85 per cent boiler pressure is 69,330 lb.

COASTAL SHIPOWNERS' VIEWS ON RAILWAY CHARGES.—The President of the Tyneside Chamber of Commerce, Mr. A. S. Witherington, stated recently that road and rail competition was a thorny problem for coastal owners and traffic continued to be lost to coastwise shipping because of rate adjustments of one kind or another. "We can accept that the financial assistance voted by Parliament to British Railways is not given to enable them to cut rates below cost but in a vast inland transport system such as we have

in this country it does pay in certain cases to accept a particular traffic at a loss," he went on. The apprehension of coastal shipowners was focused on the new railway merchandise charges scheme and the object of his remarks was not to advocate any particular line of action but simply to draw attention to the problem and to enquire what value the nation placed on its slowly diminishing coastal fleet.

JULY IRON AND STEEL PRODUCTION.—Steel production in July was at the rate of 362,500 tons a week compared with 326,400 tons a week in July, 1956. This is the highest weekly rate for July so far reached. For the first seven months of the year production averaged a weekly rate of 417,900 tons and was 6.5 per cent more than production in the corresponding period last year. Pig iron production at the weekly rate of 263,400 tons was also a record for the month of July. Production for the first seven months of the year was 7.7 per cent above that in the corresponding period of last year.

RAILWAY NEWS SECTION

PERSONAL

Colonel H. B. Everard will join the board of Rhodesia Railways when he retires next January as General Manager. His successor as General Manager will be his deputy, Mr. J. W. S. Pegrum.

Mr. M. G. Burrows, M.I.Mech.E., M.I.Loco.E., Mechanical Engineer, Southern Region, British Railways, who, as

held this position until October, 1956, when, under the re-organisation of that Region's Mechanical & Electrical Engineering Department, he became Mechanical Engineer, Southern Region, the position he now vacates.

This appointment follows a decision to terminate the bi-regional organisation in the departments of the Chief Mechanical & Electrical Engineer and Carriage & Wagon Engineer and to set up a separate organisa-

Charles A. Sublett (to be in charge of Freight Rates).

The Tilling Group announces that Mr. R. F. Bushrod, Director & General Manager, Southern Vectis Omnibus Co. Ltd., has been appointed Director & General Manager of the Lincolnshire Road Car Co. Ltd. succeeding Mr. G. H. Iles, who is retiring. The appointment will take effect from October 1 next.



Mr. M. G. Burrows

Appointed Chief Mechanical & Electrical Engineer (Designate), North Eastern Region



Mr. B. A. Khan

Appointed Chief Engineer of the Eastern Bengal Railway

recorded in our August 9 issue, has been appointed Chief Mechanical & Electrical Engineer (Designate), North Eastern Region, was educated at Lancing College and entered the service of the Great Western Railway in 1920 as an apprentice at Swindon Locomotive Works. He subsequently gained Testing House and Drawing Office experience and, in 1934, became a Technical Assistant on the staff of the Chief Mechanical Engineer, London, Midland & Scottish Railway, at Euston. In 1935, Mr. Burrows was appointed a Mechanical Inspector and, in 1938, Assistant to the Works Superintendent, Horwich Locomotive Works. He became Assistant Works Superintendent at the same works in 1942. He was Acting Assistant Works Superintendent at Crewe Locomotive Works from 1944 to 1946, in which year he was appointed Assistant Works Superintendent at Derby Locomotive Works. In 1948 he became Assistant (Locomotives) to the Chief Mechanical Engineer, Brighton, Southern Region, and, in 1949, was appointed Assistant Mechanical Engineer. He

tion in the North Eastern Region with a Chief Mechanical & Electrical Engineer responsible for the work of the two departments. As the revised organisation develops, Mr. Burrows will assume responsibility for the mechanical, electrical and carriage and wagon work for the Region.

Mr. Laurence J. Culshaw and Mr. Jocelyn F. T. Nangle have been appointed to be the auditors of the accounts of the British Transport Commission for the year ending December 31, 1957.

Mr. Robert A. Trovillion, Traffic Vice-President of the Illinois Central Railroad, is retiring on September 1. He will be succeeded by Mr. Ernest J. Carr, who will be succeeded as Assistant Vice-President of the department by Mr. Howard S. Powell, now General Traffic Manager. Mr. Powell is succeeded by two General Freight Traffic Managers, Mr. Carl A. Larsen (to take charge of Freight Sales & Service) and Mr.

Mr. Bashir Ahmed Khan, Deputy Chief Engineer, North Western Railway, Pakistan, who, as recorded in our July 26 issue, has been appointed Chief Engineer, Eastern Bengal Railway, is a Punjabi and has a very intimate knowledge of East Pakistan. He came to Bengal in 1931 and was associated with Bird & Company. Two years later he joined the former Bengal Assam Railway as an Engineer and served on that system until partition when he was appointed to the Eastern Bengal Railway, which had formerly been a part of the Bengal Assam Railway. In 1948, he was promoted to the Junior Administrative Service and was posted to Pahartali, Chittagong, as Controller of Stores. In 1951, he was appointed Deputy Chief Engineer, East Zone, in which capacity he served the railway for over a year. His transfer to the North Western Railway took place early in 1953.

Mr. N. G. Bassett Smith has been appointed General Manager of the Composition Division of the Dunlop Rubber Co. Ltd.



Mr. J. Hancock
Appointed Commercial Superintendent (Great Northern), Eastern Region



Mr. S. D. Ward
Appointed Movement Superintendent (Great Northern), Kings Cross, Eastern Region



Mr. B. T. Randall
Confirmed as Assistant to Commercial Manager, Eastern Region

Mr. J. Hancock, B.Com., M.Inst.T., Assistant to Commercial Manager (Passenger) Eastern Region, British Railways, who, as recorded in our March 8 issue, has been appointed Commercial Superintendent (Great Northern), Kings Cross, was educated at Archbishop Holgate's Grammar School, York, and joined the L.N.E.R. in the Divisional Stores Superintendent's Office, Gateshead, in 1924. After a year's tour of Canada and the U.S.A. under a Sir Ernest Cassel travelling scholarship in 1931, he became a traffic apprentice on the former L.N.E.R. and subsequently occupied positions at Kings Cross, Middlesbrough, and York. During the 1939-45 war he was commissioned in the Royal Engineers (Movement Control), served in France and the Middle East as Deputy Assistant Director of Transportation with the rank of Major, and was mentioned in despatches. On his return to railway service, he became successively: Head of the Traffic Section, Goods Manager's Office, Glasgow; Goods Agent, Stockton; Head of the Passenger Rates & Fares Section, York, and Assistant to Commercial Manager (Passenger) York. In July, 1956, he was appointed Assistant to Commercial Manager (Passenger) Eastern Region, Liverpool Street.

Mr. S. D. Ward, Movement Superintendent (L.T. & S.), Fenchurch Street, Eastern Region, British Railways, who, as recorded in our March 8 issue, has been appointed Movement Superintendent (Great Northern), Kings Cross, entered the service of the London & North Eastern Railway at Farringdon Street Goods Depot in 1927 as a Junior Clerk. He transferred to the Carriage & Wagon Department, Kings Cross in 1930 and moved to the Superintendent's Western Section Train Office in 1933. After experience in Control Offices at Headquarters and in the Doncaster district, he was appointed Assistant Yardmaster, Temple Mills in 1943. He became Chief Trains Clerk and Chief Controller, Knebworth in 1944, and was transferred in a similar capacity to the District Superintendent's Office at Stratford in 1946. In 1948, Mr. Ward became Assistant Goods Agent, Kings Cross and in 1949, Head of the Central Timing & Diagramming Section,

Eastern Divisional Operating Superintendent's Office, Liverpool Street, becoming Head of the Passenger Trains Section in the same office in 1952. He was appointed Assistant to District Operating Superintendent, Stratford in 1953, Assistant District Operating Superintendent (Southend District), Fenchurch Street, in February, 1954, and Assistant District Operating Superintendent, Stratford in November of the same year. During the winter of 1955-56, Mr. Ward spent three months in Holland studying the Netherlands Railways. He moved to Fenchurch Street in July, 1956, to act as District Operating Superintendent until the new traffic organisation was introduced in November of the same year, when he took up the duties of Movement Superintendent (L.T. & S.).

INSTITUTE OF TRANSPORT

The Institute of Transport announces the following awards for papers submitted during the 1956-57 Session and in respect of successes at the Institute's examinations held in May, 1957:—

British Transport Commission Awards

Mr. R. L. H. Farmer, Managing Director, Atlas Express Co. Ltd., for his paper "Some Problems and Practices of the Parcels Carrier."

Mr. A. A. Harrison, Chief Charges Officer, British Railways Central Staff, B.T.C., for his paper "Railway Freight Charges."

Mr. R. Bowie, Clerk, Rhodesia Railways, for a meritorious performance in the Associate Membership examination.

Mr. W. Price, Traffic Assistant, North Western Road Car Co. Ltd., for his paper "Some Facets of Congestion."

Road Transport (Passenger) Medal

Mr. W. M. Hall, General Manager, Liverpool Corporation Transport, for his paper "Municipal Transport."

Bristol and White-Smith Air Transport Awards

Medal to Mr. S. F. Wheatcroft, Economic Adviser, British European Airways, for his paper "European Air Transport Economics."

Mr. H. Motum, Assistant Public Relations Officer, Vickers Armstrongs (Aircraft

Limited, for his paper "Britain's Air Transport Future from the Aircraft Manufacturing Viewpoint."

Institute Student Award

Mr. G. G. A. Frankis, Fares Assistant to Chief Traffic Manager, Western National Omnibus Co. Ltd. and Southern National Omnibus Co. Ltd., for his paper "Some Aspects of European Bus Operation."

"Modern Transport" Award

Mr. A. J. H. Baker, Trainee, B.E.T. Federation Limited, for his paper "Current Problems of Rural Bus Operation."

Associate Membership Examination Prizes

First place: Mr. W. Yule, Clerk, Scottish Region, British Railways.

Second place: Mr. K. Daynes, Manager (Labuan), Malayan Stevedoring & Transportation Limited.

Graduateship Examination Prizes

First place: Mr. P. Pieroni, Shipping Clerk, Lep Transport Limited.

Second place: Mr. F. J. Witham, Group Insurance & Licensing Manager, Beck & Pollitzer Limited.

Mr. B. T. Randall, Acting Assistant to Commercial Manager (Freight Rates & Charges), Eastern Region, British Railways, since April, 1956, whose appointment has now been confirmed, entered the service of the Great Northern Railway in 1915 in the Goods Manager's Office. In 1922, he was appointed Personal Clerk to the Assistant Goods Manager. In 1936, after experience in various sections of the rates office, he was selected as one of the staff for the newly-formed Research & Development Section of the Goods Manager's Department, Southern Area, L.N.E.R. For two years during the war Mr. Randall was attached to the Chief General Manager's Office, L.N.E.R., after which he returned to the Goods Manager's Department as clerk in charge of the Works & General Sub-Section. Between 1949 and April, 1956, he successively held the appointments of Senior Clerk and Chief Clerk in the freight rates organisation of the Commercial Manager's Department. Mr. Randall is a member of the panel set up for discussions with the Traders' Co-ordinating Committee in connection with the new freight charges scheme.

**Mr. H. E. Smith**

Appointed Display Assistant, Public Relations & Publicity Department, Eastern Region

**Mr. D. V. Gonder**

Appointed Vice-President & General Manager, Atlantic Region, C.N.R.

**Mr. H. C. Grayston**

Appointed Assistant Vice-President, Operation, C.N.R.

Mr. H. E. Smith, Head of Outdoor & Display Section, Public Relations & Publicity Officer's Department, North Eastern Region, British Railways, who, as recorded in our August 16 issue, has been appointed Display Assistant, Public Relations & Publicity Officer's Department, Eastern Region was educated at Guisborough Grammar School. He entered railway service in 1924 and received his early training in the Middlesbrough and Darlington districts. His first senior appointment was as Chief Clerk at Haverton Hill in 1945. In 1948, he was promoted to the Chief Regional Office, York. The following year, he joined the newly formed Public Relations & Publicity Officer's Department, North Eastern Region, as Editor of the Staff Magazine. Mr. Smith became Head of the Outdoor & Display Section of the same office in 1955. In his new capacity, he is responsible, under the Public Relations & Publicity Officer, for display work including siting, provision, and maintenance of all boards and equipment for traffic publicity and commercial advertisements, train indicators, station and direction signs; general appearance of stations, exhibitions and shows; window displays, models, etc.; film and television advertising. Mr. Smith took up his new duties on August 6.

The Cape Asbestos Co. Ltd. announces that Mr. Robert Walker, Chairman, has decided to retire from the board on August 31. Mr. Giles Newton has been elected Chairman and Mr. R. H. Dent and Mr. T. C. Hale have been appointed Joint Managing Directors. Mr. T. Muir Warden has been appointed a director.

The President of the Board of Trade, the Rt. Hon. Sir David Eccles, K.C.V.O., M.P., has this month accepted the award by the Council of the British Institute of Management of an honorary fellowship of the Institute. In a letter to Mr. Harold Wilmut, C.B.E., Chairman & Managing Director of Beyer, Peacock & Co. Ltd. and Chairman of B.I.M. Council, Sir David Eccles writes of "the importance of the role which improved management has to play in our affairs. I have followed with interest the progress of the institute," he says. "I shall prize this distinction very much."

Mr. Douglas V. Gonder, Assistant Vice-President of Operation, Montreal, Canadian National Railways, who, as recorded in our July 26 issue, has been appointed Vice-President & General Manager, Atlantic Region, was born of Canadian parents in Pingyao, China, and received most of his formal education in China. He went to Canada as a youth and began his railway career in 1925 as an apprentice in the Canadian National Railway workshops at Stratford, Ont. He became a draughtsman in 1930 and was successively promoted to the positions of Mechanical Inspector, Assistant Engineer, Erecting Shop Foreman, and Roundhouse Foreman, at Toronto, Stratford, Mimico, and Montreal. In 1942 he was appointed Superintendent of the C.N.R. shops at Montreal, and two years later moved to Monkton, N.B., as General Superintendent, Motive Power & Car Equipment, Atlantic Region. He was appointed Assistant General Manager, Western Region, Winnipeg, in 1949, and a year later General Manager. Mr. Gonder was appointed Assistant Vice-President of Operation at Montreal, in 1950.

The K.G.S. Bearing Co. Ltd. announces the appointment on June 1, 1957, of Mr. A. Bates as Railway Sales Engineer. Mr. Bates joined the company from the Derby Locomotive Works, where he was dealing with the testing of materials for new vehicles built by British Railways.

Colonel S. H. Bingham (Retd.), Consulting Engineer, New York, U.S.A., has become a member of the *Chambre des Ingénieurs-Conseils de France*.

Mr. H. J. E. Smith, B.A.(Cantab.), East African Railways & Harbours, has been elected an Associate Member of the Institution of Civil Engineers.

We regret to record the death on August 16, at the age of 68, of Mr. Leslie Neeve Flatt, at the time of his death Technical Consultant with the United Steel Companies Limited. Mr. Flatt was formerly Chief Mechanical Engineer, Eastern Bengal Railway, and, later, Chief Controller of Standardisation, Indian Railway Board.

Mr. Howard C. Grayston, who, as recorded in our August 2 issue, has been appointed Assistant Vice-President, Operation, Canadian National Railways, was born in Wimbledon, England, and began his railway career as a clerk in the Toronto accounting department of Canadian National Railways in 1916. He transferred to the operation department three years later and was promoted through a series of positions to Chief Car Distributor, Montreal, in 1928. After a period as Chief Clerk in the transportation department he was made General Supervisor of Car Service, and in 1948, was appointed Chief of Car Service. Three years later he was appointed Manager of the Newfoundland District. Mr. Grayston moved back to Montreal in 1954, and assumed the duties of Special Assignments Assistant under the Vice-President of Operation.

Mr. R. J. Selley, Assistant to District Operating Superintendent, Newcastle, North Eastern Region, British Railways, has been appointed Assistant District Operating Superintendent, Darlington. Mr. Selley joined the Great Northern Railway at Kings Cross in 1920 and gained experience at various London suburban stations. He became Assistant Yardmaster, Frodingham (Scunthorpe), in 1938 and was appointed Deputy Chief Controller, District Control Office, Doncaster, in 1940. He became Chief Controller & Chief Trains Clerk at Doncaster in 1941 and, in 1943, returned to Frodingham as Yardmaster. In 1951 he moved to the North Eastern Region as Assistant to the District Operating Superintendent, Newcastle, the position he now vacates to take up his new appointment at Darlington.

Mr. Herman Press has been elected Vice-President of Finance of Alco Products Inc.

Mr. C. W. Clarke, Assistant Commissioner (Engineering), Western Australian Government Railways, has resigned.

We regret to record the death on August 4 of Mr. A. C. Meyrick, formerly Managing Director of the P. & M. Co. (England) Ltd.

NEW EQUIPMENT AND PROCESSES



Diesel Locomotive Sump Filling Equipment

DESIGNED specially for topping-up the sumps of diesel shunting locomotives, the lubricator is already in operation at Stratford Motive Power Depot, Eastern Region.

The lubricator consists of a prefabricated pallet on which is mounted a 100-gal. storage tank. It is also equipped with a platform on which the operator stands when filling locomotive sumps.

Oil is pumped from this tank to a sump by an air-operated pump through a 7-in. dia. dial meter, and 7 ft. of $\frac{1}{2}$ -in. bore hose. The hose terminates in a rotary joint and pistol type shut-off nozzle. The dial is covered with wire mesh, and angled, so that it can be easily read by the operator.

To provide compressed air to the pump, the manufacturers standard air reel is fitted beneath the platform which houses 40-ft. of $\frac{1}{2}$ -in. bore hose and incorporates a spring return and locking mechanism.

Dimensions of the unit are: Width, 2 ft. 4 in., length 5 ft., overall height 6 ft. 3 in. The price of the lubricator is £268 and delivery is eight weeks. It is marketed in the United Kingdom by Wakefield-Dick Industrial Oils Limited, 67, Grosvenor Street, London, W.1.

Fluid Cement Additive

AN additive for mortar or cement, used widely on the Continent, is now being manufactured in this country. Of application for tunnel lining, retaining walls, harbour jetties and so on, the addition of this product, Barrolin C, is stated to render cement or mortar more pliable, making it easier to spread. The mixing of cement and sand is also improved and other advantages claimed are that it prevents capillary action, rendering the mixture resistant to frost, allows the same mixture to be used for walls and ceilings, and prevents segregation and bleeding.

Because the mix dispenses cleanly, there is less wastage, and savings of up to 20 per cent in material and labour costs when applying the material are claimed.

Details may be obtained from the manufacturers in this country, Expandite Limited, Chase Road, London, N.W.10.

Versatile Stretcher-Ladder

A COMBINED aluminium-alloy stretcher-ladder which can be used for many purposes as required in rescue operations can be passed through a door window of the older type of passenger coaches; the stretcher when bearing a person can be carried in any position because of a special container type of design.

It can pass through an opening 13 in. high by 18 in. wide, or, assembled in sections, it can reach a height of 42 ft. Each section is 7 ft. 8 in. long, 1 ft. 7 $\frac{1}{2}$ in. wide and 6 in. deep. The strings are joined by bowed rungs placed 12 in. apart. The waterproofed canvas container weighs 8 lb. It is 6 ft. long and has top and bottom flaps and foldovers.

Sections are constructed with male and female ends. These are precision made to ensure snug fitting and locking. Numerous trials have shown that heavy treatment in use is insufficient to cause distortion. The bowed rungs give good foothold on the reverse side to the canvas container which, therefore, need not be removed at any time.

The canvas container does away with the need for lashings to secure a casualty. Sections can be assembled to allow a rescue team to reach the casualty, the casualty can then be secured to the top section and lowered—or raised—by using the other sections as handles. Afterwards the ladder can be re-assembled from the sections to provide the team with the means of withdrawing from the site.

The illustration shows (left) the ladder section, and the canvas container in open position ready to receive a person.

Price for a set of three stretcher-ladders, which are 21 ft. overall, complete with canvas containers and quick-release web-

bing straps is £59 5s. ex. works. Delivery is approximately three months. They are marketed by the Gloster Aircraft Co. Ltd., Hucclecote, Gloucester.

Removal of Millscale

A THIXOTROPIC jelly for the removal of scale on steel girders, sheets and plates, which is formed during rolling or heat treatment, has been developed. The material, known as Waltergel, can be applied direct to the surface of structural steelwork and so on, and is held in contact with the scale without running off the surface before it has time to perform its function.

A stir with a rod or stick causes the product to partially liquefy and produces a consistency which can readily be applied by an ordinary brush. After use, and washing down, a thin film of rust will be present on the surface which will then be in an ideal condition for treatment in the normal way by Fosco R.S., also produced by the manufacturer to provide paint-bonding and protective properties, thereby inhibiting further corrosion.

Full details of the product can be obtained from the manufacturer, the Walterisation Co. Ltd., Purley Way, Croydon, Surrey.

Grit Arrester

THE Cory Grit Arrester, though primarily intended for boiler plant, is suitable for application to incinerators and other plant of that nature on railway premises and is thought to be capable of development for application to the smoke-boxes of locomotives. The arrester is fitted to the top of the chimney, and although developed for steel chimneys can be applied to low brick chimneys in good condition or which can easily be strengthened. A variant of the original design can be applied at the base of the chimney. The grit particles collected fall through two pipes to one of two hoppers which can be emptied periodically.

The rising gases are caused to spin by the blades of a gas spinner. Solid particles are flung outwards to the periphery and are caught by a deflector ring at the top of the arrester. Gas conditions in the collecting chamber are static, but fine particles of dust are prevented from bouncing outwards and escaping by a recirculation annulus. The velocity of the spinning gas across the annulus produces suction which withdraws some gas from the collecting chamber; this is replaced by a slight inflow of gas beneath the collector ring. Some gas therefore circulates through the annulus, entraining the fine particles of grit and dust, which gradually agglomerate until they fall into the collecting chamber. Residual concentration in tests did not exceed 0.12 grains per cu. ft. and the mean was only 0.07.

The arrester is based on an original design by William Cory & Sons Ltd., and was developed, in collaboration with that company and the British Coal Utilisation Research Association, by Combustion Equipment Limited, 61, Belsize Lane, Hampstead, London, N.W.3, from whom full details are available.



Ministry of Transport Accident Report

*London Bridge, October 22, 1956 ;
British Railways, Southern Region*

Brigadier C. A. Langley, Inspecting Officer of Railways, Ministry of Transport and Civil Aviation, inquired into the accident which occurred at 8.31 p.m. on October 22, 1956, outside London Bridge station, when the 8.24 electric train to Horsham, a close-coupled four-car suburban set, was in consequence of a track circuit failure wrongly dispatched under hand signal from platform 19 instead of the 8.15 train, out and back to London Bridge via Tulse Hill and Forest Hill, which was standing at platform 20, and after travelling at low speed for 525 yd. to and along the up local line collided almost head-on with the 7.37 train, out and back to London Bridge via Norwood Junction, of similar composition, as it was taking an up local to up through crossover. Both motormen made emergency brake applications and the outgoing train had practically stopped but the incoming one was moving at about 15 m.p.h. Of the 90 passengers in the trains 15 were slightly injured or suffered from shock; four members of the train crews also were slightly injured. Nobody had to be detained in hospital. The up local line circuit breaker at South Bermondsey substation opened; it was closed immediately but tripped again. After re-setting a minute later it remained in. There was no arcing and it was decided to leave power on to keep the carriages lighted. Eventually it was cut off the up local and through lines at 8.56 and the passengers were derailed. The two trains, although buffer locked, were not derailed. Normal working was resumed on the two lines at 3.30 a.m.; meanwhile there was considerable dislocation of traffic. It was fine with dry rails.

The accompanying diagram shows the lines, signals, track circuits and other details essential to an understanding of the case.

Rules and Regulations

The report contains extracts from the rules and regulations covering action to be taken on a track circuit failure occurring controlling signals and the passing of messages between signalmen and handsignalmen, which lay down that a handsignalman must be appointed when a signal controlling the section ahead is locked at danger by disconnection of a track circuit, who must stand near the signal and warn drivers to proceed cautiously, but before doing so must satisfy himself that any facing points concerned are secured in the proper position and trailing points lying correctly. The signalman must be informed of this. Verbal messages between the two men must be carefully given and the signalman must make sure beyond doubt that they are fully understood by the handsignalman. At London Bridge there are special instructions to cover the case where the front of a long train is on the track circuit in advance of the platform starting signal and so locking it at danger. The driver must not start until he receives verbal instructions from the person in charge of the platform, who must personally obtain the signalman's permission. In these circumstances a handsignalman need not be appointed nor is it necessary for facing points to be secured, but the signalman, before giving permission, must satisfy himself that the line is clear and that the

relevant point and signal levers have been correctly operated. The entire area is track circuited and equipped with multiple-aspect signals controlled from a 274 lever power frame with mechanical interlocking. Running signals are preceded in the locking by the shunt signals along their route. Platform starting signals are approach locked by the platform track circuits and backlocked where necessary by the track circuits immediately ahead. Five signalmen were on duty at the time of the accident but the yard inspector, normally in general charge, had gone to the stationmaster's office to report on the day's working. The link between the box and South London section of the station involved in the mistake is over an omnibus circuit to telephones on the platforms.

Course of Events and Evidence

Half a minute before the departure time the signalman in charge of the South London side of the box, a man with 31 years' service, 28 as signalman, saw his indicator showing for the 8.15 train to leave platform 20. He set the route by reversing 35 points and clearing shunt signal 49, after which he pulled the lever of starting signal 17 and thought its repeater went to green, but he noticed a minute later that it showed red and that track circuit 140 was showing occupied with 136 clear. He realised that 140 had failed and asked a lineman to examine. He also informed a member of the station staff on platform 20/21 that there would be some delay. The effect of the locking, with lever 17 reversed, was to prevent 36, 48 and 51 being reversed, necessary for setting a route to the South London line for trains from platforms 18 and 19. Starting signals from platforms 21 and 22 also were locked. At 8.25 the lineman reported nothing on the line and that trains could pass over the defective track circuit. (The fault in this eventually was traced to a break in the wire leading from rails to box in concrete troughing where rats had gnawed away the insulation and the exposed wire had become corroded, a trouble which occurs occasionally; the circuits are tested every six months for faults of this kind, but these do not usually come to notice until a break occurs. Failures of track circuits from all causes have not been excessive in this installation, considering its size.)

The signalman above mentioned said he then spoke to the same person on the platform and told him he "wanted him to hand signal the Crystal Palace from No. 20 platform; one yellow 20 to Down South London, due to track failure." He received the reply "all right." He did not find out to whom he was speaking nor ask for the message to be repeated. He knew that Rule 78 (b) required a handsignalman to secure the points and advise him before the train left, but explained that there were special instructions permitting long trains to be started against fixed signals by hand signal only and this had been applied on other occasions to cases of actual track circuit failure.

These messages were received by a leading porter, a man with less than three years' service, as leading porter for nearly four months, who confirmed that the starting signal had been cleared and had returned to danger immediately, and that

he had then spoken with the box about the position.

He maintained that the second message he received was to the effect that "we want the 8.24 Horsham off platform 19 flagged out . . ."; he was positive he heard this, but said he did not repeat it back. Not having had instruction in hand signalling he gave the message to a station foreman who went immediately and passed it to the Horsham train crew. The porter agreed that there were other trains booked to leave before the 8.24, but said he never thought of them and just did what he was told. When it was suggested that the signalman might have said "hand signal train off 20 . . ." and he had mistakenly taken the words for "hand signal 8.24 . . ." he said he did not think so, but agreed that he was not surprised to get such a message because the 8.24 train stopped at fewer stations and would therefore get clear more quickly.

While the station foreman was in his office he noticed that the 8.15 train had not departed and on speaking to the signal-box learned of the failure, information which he passed to the motormen of the trains in platforms 18 and 19. When the porter arrived with the message that the 8.24 was to be flagged out he was not surprised, as it was a faster train than the others so he accepted it without question or confirmation and, after warning the guard and motorman, gave the yellow hand signal and watched the train, which was standing near the buffers, depart. He did not examine the track nor secure facing points, as required by rule, and could give no reason for his omission.

Two other signalmen gave evidence to the effect that they heard their colleague telephoning and using the words "No. 20" in his message.

At about 8.30 the last mentioned man saw from the illuminated diagram that the 8.24 train was leaving, realised it would run to the up local line, tried to attract its guard's attention, and shouted to the other signalman to exhibit a red light. He then gave "train running away on wrong line" and then "obstruction danger" to the next box.

The motorman of this train departed at slow speed but instead of leaving by his usual route found shunt signal 49 on his right instead of his left hand and a few seconds later made an emergency brake application on seeing the up train. He brought his own practically to a stand but it was then foul of crossover 166. The incoming train had had a clear run for some distance and was due at platform 13 at 8.31 through crossovers 166 and 165. Approaching at about 40 m.p.h. its motorman received a yellow aspect in an automatic signal and reduced speed. The signal ahead of this was at red but changed to green when his train entered a track circuit beginning 172 yd. in rear and displayed a route indication for the "E" section of the station. He passed at about 20 m.p.h. and reduced speed further for the first crossover. Just as he reached this point, however, he saw the opposing train and realised there would be a collision; he made an emergency brake application but struck it at about 15 m.p.h.

The yard inspector who had, as stated, gone to the stationmaster's office, heard of the accident at 8.33, sent advice to the

lapse of some time; staff therefore must always be prepared to act with the utmost promptitude in the event of such trouble.

Remarks

Verbal messages form part of the normal routine of railway working and errors in interpretation sometimes arise, but it is vital that mistakes affecting train operation should not be made. It is quite impracticable, however, to substitute written messages for verbal on all occasions, especially in emergency, and reliance must be placed on their accurate transmission. The instructions lay down that signalmen must ensure beyond doubt that messages are fully understood, but this can only be achieved by insisting upon their being given in clear unmistakable language and being repeated by the recipients. It is therefore recommended that these instructions be amplified accordingly and that supervisors pay special attention to them. Unless this is done men will get into slack habits of working and speech, as occurred on this occasion.

It seems hardly necessary now, with modern signalling controls, to secure power operated facing points by clips or scotches in accordance with Rule 78 (b) when they are rigidly locked by mechanical operation in the point machine which in turn has been locked, directly or indirectly, by a track circuit failure. In such circumstances a train might be allowed to pass a signal at danger without risk, provided always that the signalman satisfies himself that the line is clear and the required points and signals have been correctly operated. No doubt this practice was adopted at London Bridge without authority and there is reason to believe that the same principles were applied at some other busy terminals equipped with power signalling.

It is bad for discipline to retain rules no longer needed on safety grounds, especially when they impose onerous delays to traffic, because staff and supervisors will tend to ignore them. The problem is a difficult one, because Rule 78 (b) must be retained wherever mechanical signalling is in use and it may also be needed for some types of electrical failure.

Brigadier Langley himself considers, however, that efforts should be made to devise a general instruction which will be more in keeping with modern signalling practice without adversely affecting safety, and he understands that in the meantime the issue of special instructions to cover the larger power installations in the Southern Region is under consideration by the management.

Railhead Office Block at Barking

Use of porcelain enamelled steel facing panels

An interesting application of bonded, sandwich type, curtain wall infilling panels, faced with porcelain enamelled steel, is used in the new railhead office building for British Railways, Eastern Region, at Barking, Essex. The inorganic glass coating, fused to steel, gives permanent protection and a full choice of colour. Panels may be faced with enamelled steel on both sides, or may be faced only, and have a backing of galvanised steel, aluminium sheet, or Asbestolux board.

Any rigid material providing high heat and sound insulation may be used as a core. A material which incorporates all the required characteristics is phenolic resin impregnated paper honeycomb. When infilled with exfoliated vermiculite, excellent insulation is achieved for a remarkably low panel thickness. All panels are specially fabricated from higher grade vitreous enamelling quality steel sheet, and all ceramic coatings are spray-applied in order to attain flat finishes, free from draining marks. Each coating is applied separately in a furnace operating at approximately 800° C. An essential feature of the firing technique is that all architectural panels are hung during firing. This avoids the facial distortion from support bars which is inevitable if large sheet steel panels are fired in a horizontal position.

Bonding Process

After inspection for colour matching and general finish, the panels are passed on to the bonding plant adjacent to the porcelain enamelling department. In this plant the backs of facing panels and both sides of the inner core are sprayed with a special adhesive, made by the Minnesota Mining & Manufacturing Co. Ltd. The component parts of the sandwich are then placed together. The assembled sandwich is then placed in a triple daylight Interwood heavy duty platen press.

The press is closed and correct pressure applied by means of a fully-automatic hydraulic system. An automatic cut-out operates when the required pressure and temperature is reached. Panels

produced in this manner are extremely flat, rigid and firmly assembled. They incorporate a permanent and lasting finish in the chosen colour, high insulation and are easy to handle on the site.

The steel sheets supplied by John Summers & Sons Ltd. are that company's guaranteed enamelling grade. They are specially manufactured for subsequent vitreous enamelling, having a low carbon analysis and a special surface finish. When a galvanised sheet is used in the panels, this is also a Summers product, marketed under the name of Galvatite, and manufactured by the continuous galvanising process. The company is, at present, the only manufacturer in the country of this type of galvanised sheet, which has many advantages over a sheet produced by the old method. When Asbestolux is used for curtain wall panelling, it can be either as a backing, or it can be faced in several ways to provide an external panel or unit.

The panels used at Barking are of the Escot type recently developed by Stewart & Gray Limited, which company carried out the work on the building. The block was constructed to the requirements of Mr. A. K. Terris, Chief Civil Engineer, British Railways, Eastern Region, by W. & C. French Limited, Buckhurst Hill, Essex, and Sir William Halcrow & Partners, were the consulting engineers and architects.

British Railways Winter Timetables

The winter passenger timetables of British Railways, effective from September 16 until June 8, 1958, include, compared with the services introduced last September, 178 long-distance trains accelerated to save from 10 to 85 min., and 98 making non-stop runs (62 last year) at an average speed of a-mile-a-minute or more.

Several new expresses introduced in the present augmented holiday services are to be retained, while to cover the autumn and Spring holiday season in the West of England, some of the present weekday



General view of railhead office block built at Barking for the Eastern Region of British Railways

EXPRESS FREIGHT SERVICE BOOKLET.—A booklet giving details of some of the principal express freight train services affording next-morning arrivals between the more important towns served has been issued by the Western Region of British Railways for the benefit of traders. This booklet gives an indication to traders of the time their traffic will normally be available for delivery to their customers. Although the examples shown are by no means comprehensive, and are continually being improved, they give an indication of the services provided. Also in the booklet are particulars, including the telephone numbers, of Western Region District Commercial Officers and Goods Agents, with details of some of the facilities incidental to transport.

and Sunday services in the Western Region will be continued until October 12, and will restart on May 12, 1958.

Improved Anglo-Scottish Services

The present 7.45 a.m. Kings Cross to Edinburgh and the 7.30 a.m. Edinburgh to Kings Cross (Mondays to Fridays), which will be re-timed to leave Kings Cross at 7.50 a.m. and Edinburgh at 8.30 a.m., will be extended to and from Perth and will be called "The Fair Maid."

The "Heart of Midlothian" will also be extended to and from Perth and will be re-timed to depart from Kings Cross at 1 p.m. and from Edinburgh at 1.30 p.m. (Perth dep. 11.25 a.m.).

"The Aberdonian" will be re-timed and accelerated in each direction and an additional London-Aberdeen service will depart from Kings Cross at 7.45 p.m. and from Aberdeen at 7.5 p.m. daily except on Saturdays.

West of England

New weekday services will leave at 6.30 a.m. from Exeter to Waterloo and at 7 p.m. from Waterloo to Exeter and Plymouth. The former will be an hour earlier and the latter an hour later than the present first and last services respectively.

Diesel Services

Diesel train services will be introduced in the following areas on or after September 16: Yarmouth-Gorleston-Lowestoft; Crewe-Stoke-Derby; Portsmouth-Southampton-Salisbury; Southampton-Winchester; Southampton-Alton; Portsmouth-Botley-Andover Junction; Newport-Blaenavon; Newport-Brynawr; and Aberbeeg-Ebbw Vale.

There will also be an extension of the existing diesel services in the Lincolnshire, Hull, and Darlington areas, between Middlesbrough and Newcastle, and between Norwich, Cromer, Sheringham, Melton Constable, and Norwich City.

Staff and Labour Matters

Railwaymen's Wage Claim

It is understood the Executive Committee of the N.U.R. has now referred to the negotiating committee a resolution passed at the union's annual conference in July, for a new wage claim to be lodged with the B.T.C. No information is available at this stage as to the form of the claim or the date when it will be submitted.

The last general increase in railway rates of pay took place in March, 1957, and in reaching a settlement the N.U.R. agreed to give sympathetic consideration to a proposal from the Commission that railway rates and conditions should be reviewed periodically.

Engineering Conditions of Service

At the C.S.E.U. annual conference at Hastings last week, the delegates to the conference resolved to press on with their demands for: (a) a 40-hr. week with, if necessary, an embargo on overtime; (b) three weeks holiday with pay; and (c) holiday pay of £2 10s. a day.

The claim for a 40-hr. week was submitted to the employers in July and their reply is awaited. It is understood that the introduction of a 40-hr. week in the engineering industry would cost £80 million a year, the extra week's holiday £11 million, and £2 10s. a day holiday pay £18 million, making a total of £109 million a year.

Questions in Parliament

Argentine Railways' British Pensioners

Captain H. B. Kerby (Arundel & Shoreham—C.) asked the Chancellor of the Exchequer on August 1 if he would make a grant-in-aid to ensure that the pensions of some 400 members of the British Association of Argentine Railway Pensioners are pegged at the official rate of exchange of 50 pesos to the £, in view of the fact that during 1957 the only means of remit-

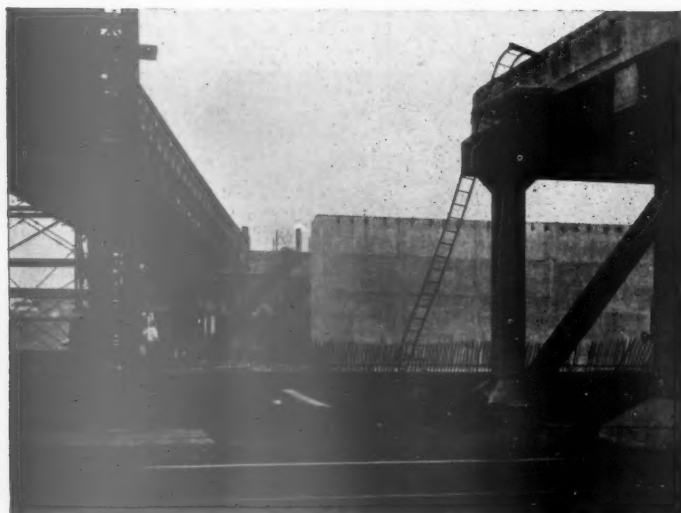
tance had been by the free market rate of 116 to the £.

Mr. W. D. Ormsby-Gore, replying for the Foreign Office instead of the Treasury, in a written reply: The Foreign Secretary has the greatest sympathy with these pensioners, and has repeatedly urged the Argentine Government to permit the official rate of exchange to be applied to the remission of their pensions during 1957. The Argentine Government has, as yet, made no official reply. In the unfortunate event of their finding it impossible to meet this request, the Foreign Secretary will certainly consider, in consultation with other Departments concerned, whether any other means can be found to assist the pensioners.

SOLARTRON NO LONGER TO SELL THROUGH AGENTS IN THE U.K.—The Solartron Electronic Group Limited, of Thames Ditton, Surrey, has decided to sell no longer through agents in the United Kingdom. In future, all enquiries should be sent direct to the Group at the Thames Ditton headquarters. They will be dealt with either by the specialist sales engineer, where necessary, or the area sales engineers of the areas whence the enquiries come.

SELF-CHANGING GEARS LIMITED AT 1957 ENGINEERING & MARINE EXHIBITION.—Three pieces of equipment of application to rail traction will be among the exhibits of Self-Changing Gears Limited at the Engineering, Marine, Welding & Nuclear Energy Exhibition, to be held at Olympia, London, commencing August 29. These are a working model of the V.S. Lilly automatic control recently fitted to a British Railways lightweight diesel railcar, a reversing unit designed for railcars and locomotives incorporating epicyclic gearing, and an exploded model of the Schneider single-stage torque converter, which the company manufactures under licence in this country.

Bridge Reconstruction in the Eastern Region



Bridge over all running lines being rebuilt at Renwick Road, Barking. On the left is a temporary Bailey Bridge. The span of the old bridge, on the right, is to be demolished, and the new centre pier is behind it



Recently rebuilt bridge on London, Tilbury & Southend line near West Horndon. Note the raised parapet to comply with safety regulations

Contracts and Tenders

Electric locomotive order for English Electric Co. Ltd.: diesel-electric locomotives required for Pakistan

English Electric Co. Ltd. has received a further order from the South African Railways & Harbours for 55, "SE" electric locomotives, to the value of some £3,300,000.

Crompton Parkinson Limited has received an order for a further 18 electric traction equipments under the British Railways modernisation plan. The equipments are for Type "B" diesel-electric locomotives of 1,160 h.p. for freight and passenger services which are to be built by the Birmingham Railway Carriage & Wagon Co. Ltd. with engines by Sulzer Bros. Ltd. Crompton Parkinson Limited already has 20 of these Type "B" equipments in hand for the Birmingham Railway Carriage & Wagon Co. Ltd., together with others under construction for British Railways, each of the equipments including a main and auxiliary generator, four traction motors, four auxiliary machines for driving compressors, exhausters, fans, and pumps, together with the electric control equipment.

British Transport Waterways have placed the following contracts:—

Thomas Smith & Son (Rodley) Ltd., Rodley, nr. Leeds: one "Super 8" excavator for use at Norton Canes Clay Mounds, nr. Brownhills, Staffs

Finns (Builders) Limited, Stepney, London: provision of quayside washing facilities at Regents Canal Dock, London

Parsons Engineering Limited, Southampton: six "Merganser" and three "Goosander" engines for narrow craft
Browne & Tawse Plant Limited, West Gorton, Manchester: 13 Hymatic hydrovane portable compressors and hedge cutters

Dow-Mac Limited, Tellington, Lincs: 26 pre-cast concrete huts for use in the North Eastern Division as lock-keepers' lobbies

Crone & Taylor (Engineering) Limited, Sutton Oak, St. Helens, Lancs: one "Big Walrus" loader with 35-ft. centre-hinged boom.

British Railways, Southern Region, have placed the following contracts:—

The Limmer & Trinidad Lake Asphalt Co. Ltd., Eastleigh, Hants: resurfacing and surface dressing of roads, footpaths and platforms, Eastleigh district

W. R. Payne & Sons, Shipley, Yorks: renovations, Martin Mill and Swanley Stations

W. & J. Glossop Limited, London, S.W.18: new car park, Ashted

C. & T. Painters Limited, London, N.W.10: renovations, Maidstone East, Arundel, Amberley, and Billingshurst Stations

Mears Bros. (Contractors) Ltd., London, S.E.26: renewal of bridge decking, Pettis Wood, Crofton Lane

The Demolition & Construction Co. Ltd., London, S.W.1: construction of carriage cleaning stages, Faversham

Caffin & Co. Ltd., London, W.C.2: new staff accommodation, Clapham Junction

W. H. Gaze & Sons Ltd., London, S.W.15: resurfacing and surface dressing of roads, footpaths and platforms, Purley district

W. R. Payne & Sons, Shipley, Yorks: renovations, Bitchington-on-Sea Station

W. G. Beaumont & Son Ltd., London, E.3: renovations, Barnham Station

W. H. Gaze & Sons Ltd., London, S.W.15: new car park, Sunningdale

Aubrey Watson Limited, London, S.W.1: new boiler house, Dorking North

A. Bagnall & Sons Ltd., Teddington, Middx: renovations, Bricklayers' Arms "L" Shed (new part)

G. E. Prince & Son Ltd., Southampton: renewal of roof, erecting shop, Eastleigh Locomotive Works

G. N. Haden & Sons Ltd., Eastbourne: installation of central heating, Newhaven Motive Power Depot, and Lancing New Signalbox

J. Jeffreys & Co. Ltd., London, S.E.1: installation of central heating, Dorking North

T. W. Palmer & Co. Ltd., London, S.W.19: constructional steelwork, Weymouth

Mitchell Bros. Sons & Co. Ltd., London, S.W.1: installation of Travolators and construction of new circulating area, Waterloo & City Railway, Bank Station
Highways Construction Limited, London, S.W.1: repairs to roads, Waterloo Station

J. Jeffreys & Co. Ltd., London, S.E.1: installation of central heating and hot water services, Queens Road, Longhedge Stores Depot

R. Corben & Son Ltd., Maidstone, Kent: reconstruction, Chichester Station.

British Railways, North Eastern Region, have placed the following contracts:—

English Electric Co. Ltd., Liverpool: m.v. switchboard, Dinsdale Rail Welding Depot

Cowans, Sheldon & Co. Ltd., Carlisle: electric wheel drop and traverser, York North Motive Power Depot

Enfield Cables Ltd., London: feeder cables, York Station lighting, and m.v. cables, York (Toft Green).

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from Pakistan for diesel-electric locomotives as follows:—

19 broad gauge (5 ft. 6 in.) diesel-electric locomotives complete, strictly in accordance with the specification, instructions to the tenderers, schedule, and conditions of contract

25 broad gauge (5 ft. 6 in.) diesel-electric locomotives complete, strictly in accordance with the specification, instructions to the tenderers, schedule, and conditions of contract

additional cost for dynamic brakes for each locomotive (as detailed in clause 20 of the particular specification)

adequate spare parts for the maintenance and repairs of above locomotives to give three years trouble free working cost of servicing engineer for six months.

The issuing authority is the Ministry of Communications (Railway Division). The tender No. is PRS-57/LOCO/6/TDR. Bids should be sent to the Director General (Railways), Railway Division, Ministry of Communications, Government of Pakistan, Karachi. The closing date is October 19, 1957.

A copy of the tender documents, includ-

ing specification and drawings, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). The reference ESB/19710/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from South Africa for track jacks as follows:—

600 track jacks, type "A" in accordance with specification CCE.2/20-1957

The issuing authority is the Stores Department, South African Railways. Bids, in sealed envelopes, endorsed "Tender No. A.6729: Track Jacks," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is September 6, 1957.

A copy of the tender documents, including specification, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). A photo-copy set can be purchased from the Branch for 11s. The reference ESB/19765/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for piston rod packing as follows:—

3,050 C.I. piston rod packings complete with garter spring 3½ in. min. bore of ring for 4 in. dia. piston rod suitable for XP & WG type engines, C. Rly. drg. No. CLA. 92, alt. 3 CLA. 93, alt. 1, CL. 1144; alt. 8-CL. 1145 alt. 7, (D.G.S. & D. Nos. 8684/I, 8685, 8686/2 8687/2) & I.R. part No. L/PK.609, alt. 1, specn. as stated on drgs.

The issuing authority is the Director General of Supplies and Disposals. The tender No. is SRIA/16411-H/II. Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is August 30, 1957. A set of tender documents is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). The reference ESB/19819/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for axlebox guides as follows:—

48 axlebox guides RH, HS (L.I & T) HSM (L.I) L. & L.T. (L.I.T. & D) as per LW drgs. FR. 104A alt. 2 (D.G.S. & D. No. 12186) WA. 333D. alt. 6 (D.G.S. & D. No. 12187) item 1, & WA. 335D, alt. 4 (D.G.S. & D. No. 12188) item 1 and to I.R.S. specn. No. R-32/54, clause 54 (steel casting to I.R.S.S. M-2/48 class A grade I).

The issuing authority is the Director General of Supplies and Disposals. Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is August 30, 1957. A set of tender documents and drawings is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1.). The reference ESB/19814/57 should be quoted in any correspondence with the Branch.

Notes and News

Platform Surfacing Material.—The third line of the second paragraph dealing with Wearbond on page 168 of our August 9 issue should read "be laid to any thickness from 1 in. to a feather edge," and not $\frac{1}{2}$ in., as printed.

Wagon Finance Interim Dividend.—The interim dividend of the Wagon Finance Corporation Limited for 1957 is 7½d. a share. This is on capital increased from £250,000 to £1,250,000 by the calling up of 16s. a share. On the former 4s. shares, an interim dividend of 4½d. was paid in 1956, with a final of 1s. 1½d. and a tax-free jubilee distribution of 6d. from capital reserves.

Railway Material Exports.—The value of exports of railway vehicles from the United Kingdom averaged £3,806,000 a month in the first quarter of 1957, and £3,696,000 in the second quarter. This compares with a monthly average of £3,729,000 in the first half of 1956. The value of complete locomotives exported was £2,900,000 in the first quarter and £2,500,000 in the second. In the same quarters of 1957 the value of other railway vehicles, including parts, was £8,500,000 and £8,600,000 respectively.

New Plant for Stewarts and Lloyds.—Stewarts and Lloyds Limited plans to build an electric resistance weld tube plant adjacent to the John Summers steelworks at Shotton, near Chester, which will supply hot rolled steel strip to the new plant. Production is expected to begin in 1960, the plant taking 100,000 tons of hot strip annually at first, with a gradual increase to 200,000 tons. The tubes produced will range from 6½ in. to 16 in. outside dia. and, in the main, will be exported for use by the oil industry.

Luncheon to Western Region Mayors.—Eight members of the active and retired staff of the Western Region, elected to the office of mayor of their respective boroughs for the current year, with one member of the staff who has been made

Sheriff, and a Chairman of a County Council, were the guests of Mr. R. F. Hanks, Chairman of the Western Area Board, and Mr. K. W. C. Grand, General Manager, Western Region, at luncheon at Paddington on August 16. They were Messrs. C. P. Hathaway (leading porter) (Mayor of Bridgnorth); L. B. Rothero (retired signalman) (Rhondda); F. G. Hopton (senior checker) (Newport (Mon.)); A. E. Harries (clerk) (Swansea); W. J. Hill (district inspector) (Willesden); T. S. W. Smart (retired driver) (Reading); A. G. Wycherley (retired fitter) (Abergavenny); G. W. Every (driver) (Llanelli); E. O. Roberts (stores issuer) (Sheriff of Oxford); E. Phillips (retired yard inspector) (Chairman, Glamorgan County Council) Three mayors who are also Western Region employees were invited to the Luncheon but were unable to be present: Messrs. J. A. Sparks, M.P. (clerk) (Acton); E. W. Boys (supervisory foreman) (Battersea); and T. R. Jones (foreman) (Bath).

Call for Railway Closed Shop.—At a meeting in Manchester last week, the district council of the National Union of Railwaymen carried a resolution that the time was opportune for launching a nation-wide campaign demanding the elimination of non-unionism of British Railways and also urging that non-unionists should be excluded from future benefits. The council is asking the N.U.R. to commence negotiations with the B.T.C. on compulsory trade unionism.

Quick Movement of Harvester Machines.—The Scottish Region was informed by manufacturers of harvesters at Kilmarnock that a consignment of these machines must move by road, as harvesting arrangements in the South of England had come forward earlier than anticipated, manufacturers were behind with their production of harvesters and a matter of hours was vital in successful completion of sales with their customers. The prompt answer by British Railways was the provision of special fully-fitted trains to nominated destinations, supplemented by special rail or road arrangements to ensure speedy presentation of the harvesters to the farmers. All Regions of British Railways

co-operated, and consignors expressed their satisfaction with the outcome. The first train left Kilmarnock at 11.5 p.m. on July 19 (Friday) for Wolverhampton, conveying 20 harvesters for widely scattered destinations over the South of England. Half the harvesters were available during Sunday and the last of them reached destination by mid-day on Monday.

Hurst Nelson Setback.—The profits of Hurst Nelson and Co., Ltd., suffered a setback in the year to March 31. The dividend is cut from 15 per cent to 7½ per cent less tax, but this time shareholders are to receive a tax-free distribution of 2½ per cent from the balance of the dividend equalisation fund and there is again a payment of 5 per cent tax free from the balance of surplus on the realisation of trade investments. The group profit is reduced from £204,432 to £142,091 and the net profit from £52,946 to £19,430 after charging £77,912 (against £112,462) for taxation.

Passenger Service Being Withdrawn from Stairfoot.—The Eastern Region of British Railways announces that on and from September 16, 1957, Stairfoot station will be closed to regular passenger traffic. Passengers will be catered for at Barnsley Court House and Wombwell Central stations, and there are frequent bus services operating in the area. A collection and delivery service for parcels will continue to be provided and facilities will continue to be available at Stairfoot for parcels handed in there for despatch, or addressed there "to be called for."

British Coal Utilisation Research Association Annual Report.—The annual report for 1956 of the British Coal Utilisation Research Association states that of the 218 million tons of coal which were consumed in Britain in 1956, 38 million tons were used in the home. The total figure represents 85 per cent of the total energy used in sustaining industrial life and in maintaining the standard of living. The report states that it may be 20 years before nuclear power can supply a major proportion of the energy requirements now met by coal, as distinct from bridging the gap between demand and supply. Even then, if industrial activity grows at the present rate, coal fuel in considerable quantities may be needed for as long again.

New British Standards.—British Standards have been issued for the determination of tetraethyl lead in gasoline by the hydrochloric acid method (B.S. 2878:1957) and for the determination of water and sediment in crude and fuel oils (B.S. 2882:1957). They are being issued in order to give national standards status to methods of test published by the Institute of Petroleum. The publications specify requirements for the apparatus, the reagents to be used, and the procedure for carrying out the tests. The methods of calculating and reporting results are laid down. The methods specified in B.S. 2878 and B.S. 2882 are technically identical with Institute of Petroleum specifications IP 96/55 and IP 75/57 respectively. Copies of these standards may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1. B.S. 2878, price 3s., and B.S. 2882, price 4s.

International Nickel Interim Report.—The interim report of the International Nickel Co. of Canada Ltd. and sub-



(Left to right): back row: Messrs. W. R. Stevens, South Wales Area Officer; G. S. Halliday, Road Motor Engineer; A. C. B. Pickford, Chief Commercial Manager; C. W. Powell, Assistant Operating Superintendent; E. O. Roberts; H. G. Bowles, Assistant General Manager (Administration); G. W. Every; H. E. A. White, Running & Maintenance Officer; S. G. Ward, Regional Establishment & Staff Officer; C. J. Rider, Public Relations & Publicity Officer; Front row: Messrs. F. G. Hopton; A. E. Harries; C. P. Hathaway; E. Phillips; K. W. C. Grand; R. F. Hanks; T. S. W. Smart; W. J. Hill; L. B. Rothero; and A. G. Wycherley

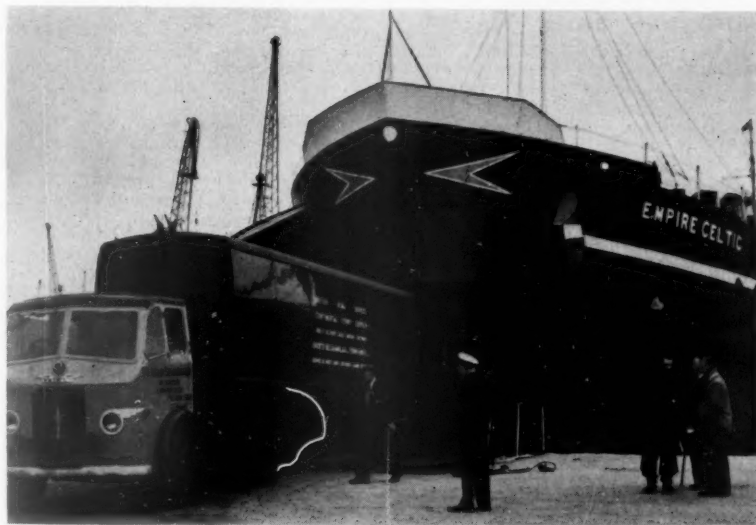
sidaries for the six months ended June 30, 1957, shows net earnings in terms of U.S. currency of \$45,601,000 after all charges, depreciation, depletion, taxes, and so on, equivalent to \$3.12 per share on the common stock. For the corresponding first six months of 1956 net earnings were \$51,772,000, or \$3.48 per common share, the record for any six months' period in the company's history. During the last six months of 1956 earnings were \$44,524,000, or \$3.02 per common share. Net earnings of \$22,097,000, or \$1.51 per common share, in the three months ended June 30, 1957, compare with \$23,504,000, or \$1.61 per common share, in the first quarter. In the three months ended June 30, 1956, net earnings were \$25,158,000 or \$1.69 a share on the common stock.

Drunk in Charge of Locomotive.—The driver and fireman of a locomotive were sentenced to 18 and 12 months' imprisonment respectively at Traunstein in Western Germany on August 14. They were said to have driven a train, while drunk, at 85 m.p.h. between Salzburg and Munich. A number of passengers were injured. The men pleaded during the case, believed to be the first of its kind to come before a German court, that they were trying to make up lost time.

B.R.S. Continental Ferry Service.—The accompanying illustration shows a 24-ft., 10-ton, fifth-wheel semi-trailer leaving the ferry at Tilbury. As already announced, British Road Services are developing their direct road services to and from the Continent, using the ships on the Tilbury-Antwerp route of the Transport Ferry Services of their Associated undertaking, the Atlantic Steam Navigation Co. Ltd. A similar joint service has already proved successful for traffic to and from Northern Ireland.

Hypoid Gears on Show.—At the Engineering, Marine, Welding & Nuclear Energy Exhibition to be held at Olympia on August 29-September 12, the E.N.V. Engineering Co. Ltd. will show what is probably the widest range of spiral bevel, Zerol, and hypoid gears ever assembled at one time. These will range from less than 1-in. dia. up to 52-in. dia. and will illustrate the company's exceptional capacity for this class of work. Of particular interest will be what is believed to be the largest hypoid gear ever produced in this country, examples of precision spiral bevel and Zerol gears with profile ground teeth including a large spiral bevel gear for use in the main drive of a gas-turbine locomotive. Railway traction drives of various types will be exhibited including a hypoid drive gearbox recently introduced, for tramcar and railcar drives.

Firth Brown Tools Meeting.—The annual meeting of Firth Brown Tools Limited was held in London on August 14. In his circulated statement, Lord Aberconway, the Chairman, stated that the consolidated trading profit before tax for the year under review was £579,722. Though less than last year, the directors considered this as in no way unsatisfactory. Deliveries were somewhat larger both in volume and in value than during the previous year. Conditions at home and abroad continued to be highly competitive and there was no expectation that in the foreseeable future it will cease to be so. Costs had continued to rise steadily and recently another basic wage increase had come into effect; prices obtainable had not increased proportionately. A dividend of 1½ per cent was



British Road Services semi-trailer on Continental service via Antwerp/Tilbury, going ashore at Tilbury Docks

recommended on the ordinary shares. The report and accounts were adopted.

Hampstead Tube Exhibition.—The fiftieth anniversary of the opening, on June 22, 1907, of the Hampstead Tube, now part of the Northern Line, is featured in an exhibition arranged by London Transport at Charing Cross Underground Station, and opened on August 20. The exhibits include many striking pictorial posters issued at various times to advertise the original line from Charing Cross (now Strand) to Golders Green, and Highgate,

and its subsequent extensions, and the junction, between Euston and Camden Town, with the pioneer City & South London Railway. A number of old maps and tickets also are displayed. The history of the undertaking is described and illustrated in a booklet, "Fifty Years of the Hampstead Tube," by Charles E. Lee, which is on sale at the exhibition, price 2s. A large-scale map of the railways of London Transport shows illuminated the route of the proposed Victoria Line from Victoria to Walthamstow. The exhibition will remain open until September 10.

Southern Region Publicity



Silkscreen posters produced by the Department of the Public Relations & Publicity Officer, Southern Region, showing the successor of the former map poster featuring the "Atlantic Coast Express"

Railway Stock Market

Stock markets are recovering from the uncertainty arising from the variety of currency rumours which followed the steps taken to safeguard the franc. British Funds, however, have not recovered much of their recent sharp fall after foreign selling of 3½ per cent War Loan and some other stocks because of fears that the £ might be devalued. It is realised that these rumours were quite unfounded; in fact, devaluation of the £ is one of those rumours which crop up on the Continent from time to time. The only prospect of revaluation of sterling would be in connection with a general currency adjustment in Europe, and that would probably have to await an upward adjustment in the West German mark, which is over-valued in relation to all other major currencies except the dollar.

The currency uncertainties have been an influence in stock markets but dollar stocks have lost ground again owing to the trend of Wall Street. Canadian Pacific eased further from \$68 to \$67½ and sentiment was also affected by the lower profits shown in the half-yearly statement. White Pass shares at \$21½ have been reactionary.

Peru Transport shares were \$1½ and Mexican Central debentures 69. In other directions, San Paulo Railway ordinary units have again changed hands around their par value of 3s. United of Havana second income debentures were 8½. Talit Railway shares have marked around 12s. while Costa Rica ordinary stock changed hands around 22, Chilean Northern debentures were 41½ and Dorada ordinary shares at 75 has held its recent advance.

Antofagasta ordinary and preference stocks have been rather more active, and firmer at 33½ and 44½ respectively, the good yields bringing in buyers.

Nyasaland Railways shares at 12s. 6d. were the same as last week with the 3 per cent debentures 60. Midland of Western Australia stock was again quoted at 7½.

The shares of locomotive builders and engineers have been steadier with Beyer Peacock 5s. shares continuing to change hands around 10s. Hurst Nelson at 33s. have maintained their better trend, but North British Locomotive at 18s. 10½d. were a little easier, and Birmingham Wagon were marked down to 19s. 7½d. G. D. Peters again had a quotation of 27s. 6d. remaining tightly held. Gloucester Wagon were 15s. 6d. and Wagon Repairs 5s. shares firmed up to 13s. Charles Roberts 5s. shares have been firm at the higher level of 11s. helped by the strong position shown by the accounts and the chairman's annual statement. Westinghouse Brake have been firm at 37s. 9d.

There was a better trend in Associated Electrical at 60s. 3d., General Electric were 48s. xd. and English Electric 60s. 6d. with Crompton Parkinson 5s. shares quoted at 16s. 4½d. Moreover, in other directions Brook Motors 10s. shares strengthened to 37s. 9d. and B. I. Cables rose to 50s.

British Oxygen at 35s. 3d. have been steady, while British Aluminium were little changed on balance at 58s. 9d. with the new shares at a premium of 1s. 6d. Shares of the Hawker Group have eased to 41s. but remained active on the view that before the end of the year more money may be raised by a rights issue to shareholders.

Despite confidence that the dividend will be maintained, Tube Investments eased to 66s. 3d. F. Perkins 10s. shares were 13s., while William Jacks 5s. shares at 12s. 1½d.

responded to the financial results. B. S. A. have strengthened to 31s. on reports that the internal reorganisation in the group since Mr. Sangster has been Chairman, is making progress. The 10s. shares of the Dowty Group rose to 35s. and Dunlop Rubber shares have improved to 20s. 3d. on the view that the fall in the shares had been carried too far. Pressed Steel 5s. shares were little changed at 17s. 1½d. Elsewhere, T. W. Ward have been steadier at 79s. 9d. while Davy & United Engineering shares held steady at 60s. 9d. and the 2s. 6d. shares of the Butterley Company were again 22s. Triplex Glass shares remained around 37s., since publication of the results and the maintained 20 per cent dividend. Channel Tunnel shares after their recent sharp fluctuations appear steadier around 16s.

Forthcoming Meetings

Open currently and until further notice.—

British Transport Commission: Historical Exhibition "Transport Treasures" in Shareholders' Meeting Room, Euston Station, from 10 a.m. to 6 p.m. on weekdays, and 2 to 6 p.m. on Sundays. Admission 6d.

August 24 (Sat.).—Permanent Way Institution, Manchester & Liverpool Section, visit to English Electric Co. Ltd., Preston. Party limited to 30 members.

August 30 (Fri.).—to September 8 (Sun.).—Railway Correspondence & Travel Society. Tour of Denmark.

September 3 (Tue.).—Permanent Way Institution, Leeds & Bradford Section, at the British Railways Social & Recreation Club, Ellis Court, Leeds City North Station, at 7 p.m. Paper on "Ballast and formation renewal," illustrated by lantern slides, by Mr. M. F. Barbey, assistant to Engineer (Bridges), North Eastern Region, York.

OFFICIAL NOTICES

MECHANICAL ENGINEERS, MALAYAN RAILWAY. To take charge of (a) a group of Railway Workshops engaged in the repair of locos, the building and repair of coaching and goods stock and the maintenance of mechanical plant and equipment, or (b) a District in the Loco Operating Branch including the supervision of Running sheds, and the running maintenance of locos, carriages, wagons and marine craft. Three years' contract appointment. Salary range £1,145-£2,378 point of entry depending on experience. Substantial cost of living allowance. Gratuity of £232 to £324 per annum. Free passages for officer, wife and three children under 12. Quarters if available at reasonable rents or housing allowance in lieu. Candidates must be A.M.I.Mech.E. or have passed or be exempt from Parts I and II of the exam. for A.M.I.Mech.E. Write Director of Recruitment, Colonial Office, S.W.1, stating age, qualifications and experience. Quote BCD 110/23/07.

LONDON TRANSPORT invites applications for post of **EQUIPMENT ENGINEER** to control section of Development Division of department of Chief Mechanical Engineer (Railways), Acton, dealing with design and development of all items of equipment used on Executive's rolling stock traction motors and control gear, brakes, air-operated doors and other auxiliary equipment. Qualifications: A detailed knowledge of equipment involved, with preferably some knowledge of traction motor and motor generator design and characteristics; a general knowledge of the construction of railway rolling stock advantageous; membership of one of the senior engineering institutions; an engineering degree in electrical subjects. Salary range, £1,210 to £1,420. Free travel. Medical examination. Contributory superannuation scheme after probation.—Please apply within seven days to Recruitment and Training Officer (F/EV 650), London Transport, 55, Broadway, London, S.W.1.

THE NIGERIAN RAILWAY CORPORATION invites applications for the following post: **ASSISTANT ENGINEER**, Salary £800 × £50-£1,600 p.a. plus £300 p.a. overseas pay. Candidates should preferably be A.M.I.C.E. or have passed Parts I and II or equivalent and have two years' railway engineering experience or five years' experience of general construction in connection with a railway. Available on pensionable terms, or on contract with 20 per cent. gratuity p.a. of total pay. Tours: 15 months' tours followed by 15 weeks' leave in U.K. on full pay. Allowances: In addition there are attractive allowances.—Applications to: The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

THE GENERAL ELECTRIC COMPANY LIMITED, WITTON, BIRMINGHAM, requires

SENIOR DESIGN DRAUGHTSMEN for Control Gear design and layout work in A.C. and D.C. Electric Traction. High salaries are offered for these positions in a rapidly expanding department. Draughtsmen without this specialised experience also required. Please write with full particulars to

The Staff Manager.

LONDON TRANSPORT requires **EXECUTIVE ASSISTANT** to take charge of Technical Press Section of Press Office. This post, which is one of responsibility and interest, calls for a sound and thorough editorial experience and training in transport and allied Technical Press. Requirements include ability to maintain an information service to Transport Technical Press concerning London Transport's activities, the initiation and preparation of press notices on all major developments, the arrangement of Technical Press visits and facilities and the maintenance of general liaison with the transport and associated Technical journals, combined with a wide general knowledge of road and rail passenger transport and of the London area. Salary range, £990-£1,155. Free travel. Medical examination. Contributory superannuation scheme after probation.—Please apply within seven days to Recruitment and Training Officer (F/EV 651), London Transport, 55 Broadway, London, S.W.1.

BRITISH TRANSPORT COMMISSION. ELECTRIC TRACTION ENGINEER (Research) required in the office of the Commission's Chief Electrical Engineer (British Railway Division), London. Knowledge all aspects railway electrification and ability to envisage potentialities of A.C. system and improvements of D.C. system; experience in other fields of engineering; Honours Degree in engineering and good working knowledge of scientific matters. Responsible for general direction of research effort in railway electrification and co-ordination of research between Universities, manufacturers and within the activities of British Railways. Commencing salary up to £3,000 p.a. according to qualifications. Further advances dependent on degree of development of work. Superannuation scheme. Certain free travel facilities. Medical examination.—Write, stating age, qualifications and experience to Manpower Adviser, British Transport Commission, 222 Marylebone Road, N.W.1, within 14 days.

WORKING FOREMEN (Carriage and Wagon Maintenance) required by **EAST AFRICAN RAILWAYS & HARBOURS ADMINISTRATION** for one tour of 36-45 months with prospect of permanent. Salary scale (including Inducement Pay) £863 rising to £968 a year. Commencing salary according to age. Outfit allowance £30. Free passages. Free quarters or an allowance in lieu. Liberal leave on full salary. Candidates, between 25 and 35, must have served an apprenticeship to Carriage and Wagon fitting with British Railways or a firm of carriage and wagon builders, preferably including some experience in the Lifting Shed. Subsequent experience of vehicle running with Carriage and Wagon examining staff, detecting and rectifying mechanical and power brake defects on vehicles in service, power brake testing, etc. and experience of Westinghouse Air Brake desirable.—Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2B/41618/RA.

THE NIGERIAN RAILWAY CORPORATION invite applications for the following post: **SIGNAL TELEGRAPH INSPECTOR**, Salary £700 × £50-£1,200 p.a. plus £300 p.a. overseas pay. Candidates must possess a working knowledge of the installation and servicing of the General Electric Company's telephone train control apparatus, the Railway Signal Company's electric train staff instruments and mechanical signalling apparatus, particularly double wiring, as manufactured by the Westinghouse Brake & Signal Company. Preference may be given Associates of the Institution of Railway Signal Engineers or Graduates of the Institution of Electrical Engineers. Available on pensionable terms, or on contract with 20 per cent. gratuity p.a. of total pay. Tours: 15 months' tours followed by 15 weeks' leave in U.K. on full pay. Allowances: In addition there are attractive allowances.—Applications to: The London Representative, Nigerian Railway Corporation, 11, Manchester Square, London, W.1.

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